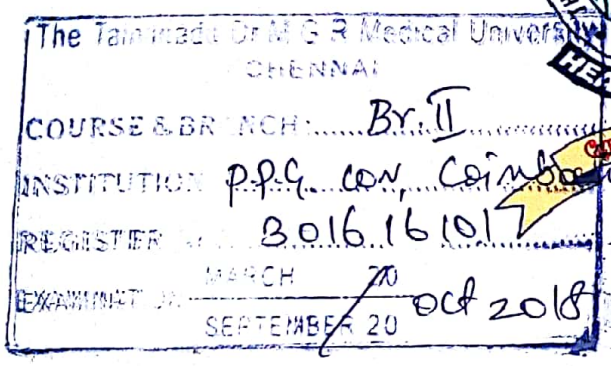
A COMPARATIVE STUDY TO ASSESS THE EFFECTIVENESS OF WARM AND TEPID SPONGING IN REDUCING HYPERTHERMIA AMONG CHILDREN BETWEEN THE AGE GROUP OF 1 TO 6 YEARS IN ASHWIN HOSPITAL AT COIMBATORE



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BRIGIT A P [SR. DEEPA PETER]

By

Reg. No : 301616101

A DISSERTATION SUBMITTED TO THE TAMILNADU Dr. M.G.R. MEDICAL UNIVERSITY, CHENNAI IN PARTIAL FULFILMENT OF REQUIREMENT FOR THE DEGREE OF MASTER OF SCIENCE IN NURSING

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CHAPTER - 1

INTRODUCTION

The child is the beauty of God present in the world, that greatest gift to a family

– Mother Teresa

Let us sacrifice our today so that our children can have better tomorrow

–APJ Abdulkalam

Health is wealth means being healthy, health means richness, and this proverb reminds us that a healthy person is rich, even if he does not have money. Being wealthy means being physically and mentally stable. In life, it is more important to be healthy than to accumulate riches without experiencing the peace and happiness that good health brings. Even if we have money, riches cannot buy good health. Good health is cultivated and maintained without necessarily being rich. (Harshit Shah, 2017)

Every year of a child's life is precious but when it comes to development, the first six years are the most important. It is when they develop physical, mental and social skills that remain with them for life. Fever remains the most common concern prompting parents to present their child to the hospitals. A high temperature can be alarming. It indicates the presence of a serious illness. The hypothalamus controls body temperature and it increases the body temperature as a way to fight the infection. (Renee A.Ali, 2017)

Fever is a common response of the body to infection. It makes people feel unwell and can result in serious complications such as convulsions. Although the mainstays of antipyretic treatments are drugs such as paracetamol and ibuprofen, physical methods are also used. Physical methods for cooling are often recommended for treating fever. The methods that are

cheap, readily available and most commonly used include; tepid sponging, bathing, fanning, and cooling blankets. Tepid sponging and bathing are widely used by caregivers and doctors. Rubbing alcohol on the skin, cool enemas, and ice packs have also been used for cooling the body during fever, but there are indications that these methods may cause severe adverse effects in exceptional cases. Heat stroke or extremely high body temperature (hyperthermia), conditions under which antipyretic drugs are deemed unsuitable, submerging patients in cold water is recommended to cool them quickly. Sponging reduces heat through conduction, convection, or evaporation. In comparison to our study group, supportive ways of fever management at home adopted by the Nigerian mothers include reducing clothing and exposure to air (91.7%), tepid sponging (90.1%), cold bath (67.7%), fanning (9.4%). Similarly, the most commonly reported methods to treat feverish child in Palestine are sponging and giving antipyretic medication. (Hanadi Mukhtar,2014)

Today's children are tomorrow's citizen. It is necessary to take care of children. The children's are the major consumers of health care. In India 35% of the total populationchildren are considered unhealthy in our country. (Wong's, 2007)

Child health is a state of physical, mental, intellectual, social and emotional well-being and not merely the absence of disease or infirmity. Healthy children live in families, environments, and communities that provide them with the opportunity to reach their fullest developmental potential. (Health Workgroup, 2007)

Fever was first recognized as a human disease in Australia in 1935. Fever is also known as pyrexia and febrile response, Fever is frequently associated with mild discomfort, achiness, dehydration, and sometimes delirium, and benign febrile seizures (Reeves-Swift, 1990)

A fever can be caused by many medical conditions ranging from not serious to potentially serious. Fever is common symptom of childhood illness. Fever is a natural response of the body that helps in fighting of foreign substances. Thermoregulatory center in the hypothalamus regulates body

temperature. Once the temperature raises the person often feels warm, the cellular metabolism increases, oxygen consumption rises, heart rate and respiratory rate increases to meet the metabolic needs of the body. Increased metabolism uses energy that produces additional heat. Fever is usually associated with physical discomfort, and most people feel better when a fever is treated. But depending on the age, physical condition, and the underlying cause of fever many experts believe that fever is a natural bodily defense against infection. Children usually have a higher fever than adults because their immune system is less mature.

The average body temperature is 37°C or 98°F. It varies according to the age, time of day, activity, physical activity. Body temperature is generally highest during the evening. It can go up as a result of physical activity, emotional outburst, eating, wearing heavy thick clothes, medications, room temperature, and humidity. This holds especially in case of younger children (PurvaDuram, 2007)

Studies shows that infection is a major cause of morality in children aged 0-5 years. There are over 100 deaths from infection in children aged 1-12 months each year in England and Wales. In the first year of life, infection is second only to congenital defects as a cause of death. In children aged 1-4 years there are around 30 deaths from infection per year of life, and infection is the most common cause of death in this age group. (McFaul, 2009)

Fever's greatest significance may be as an indicator of illness. In children, fever is usually caused by self- limiting viral illnesses and less frequently due to bacterial infections (Schmitt, 1993)

Temperatures in the normal febrile range (37.8 to 40°C) are not considered dangerous; however, treatment of the fever is frequently instituted as a comfort measure for the patient, and to relieve parental anxiety (Kilmon, 1987)

The most frequently recommended interventions are antipyretic medication for fever over 39°C, and tepid sponge bathing for fever over

41.1°C; parents also report using tepid sponge bathing for fever second in frequency to antipyretics (Andersen, 1988)

The anterior hypothalamus in the human brain normally regulates the set-point for central body temperature at 37 +/- 1°C and responds to an increase or decrease in environmental temperature by sending nerve signals that lead respectively to heat loss or conservation. Heat loss is achieved principally by the dilation of small blood vessels in the skin and by sweating. If these mechanisms are insufficient to compensate for a heat gain from the environment, the core temperature rises above the set-point, a condition called hyperthermia**.** Hyperthermia is elevated body temperature due to failed thermoregulation that occurs when a body produces or absorbs more heat than it dissipates. Extreme temperature elevation then becomes a medical emergency requiring immediate treatment to prevent disability or death. (Stephanie, 2007)

In humans, shivering, constriction of blood vessels to the skin, and increased metabolic rate cause a rise in core temperature between 38°C and 41°C. During febrile illness, the hypothalamus carefully controls the rise in the set-point so that the body temperature rarely exceeds 41°C, even in children. By contrast, in hyperthermia temperatures often rise above 41°C, which can lead to heat stroke (Khogali, 2009).

Non pharmacological treatment of hyperthermia mainly includes physical cooling. These nursing measures includes providing cool drink, ice packs, cool flannels, removing clothing, indirect method includes the use of fan and reduction of room temperature improving the ventilation by fan or air conditions, unwrapping, loose clothing, tepid sponging or cold bath. Sponging consists of the application of liquid by means of a sponge, a wash-cloth, or hand, in which the chief effect is derived from the liquid itself, little friction being needed. Sponge bath with warm water reduces fever by dilating superficial blood vessels, thus releasing heat and lowering body temperature (Richardson, 2010)

Sponging is a technique often used to help lower the child's fever. Sponging involves taking a lukewarm sponge and gently washing the child's skin. If the child starts to shiverwill need to use warmer water. Should not use ice or alcohol in a sponge bath with a child. Bathing for a febrile patient should be viewed from two angles. First bath as a treatment for reducing the elevated temperature and second bath as a regular cleansing act (Yousef FJ, 2010).

Bathing with lukewarm water, need to be encouraged in febrile patients. Bathing the child at the height of fever, especially with cold water, is not advisable. Sick, bed ridden and elderly patients may be given a warm sponge bath and a regular bath or cold sponging is not advisable in these patients. Luke warm water cause dilation of sweat glands thus reducing stink of sweating and provides freshness. Warm bathing may be given to the child who is uncomfortable and does not respond to antipyretic therapy after 40 minutes with fever over 41°C. (Schmitt, 2011)

In tepid sponging the temperature of water is less than body temperature, so vasoconstriction occurs, so fever will be reduced by raise after a particular period of time. In warm sponging the temperature of water is same or greater than that of the body temperature, so vasodilatation occurs so more heat is drawn out and less discomfort (Potter, 2006).

The best treatment of fever was found to be alternating hot and cold application. The hot application to the skin increases oxidation of toxins and increased blood flow to surface vessels of skin. Heating surface of the skin increases the ability of the phagocytes to destroy the germs and detoxify the blood. Hot bath therapy regulates warmth, provides health blood circulation and has a soothing, healing effect. Hot water application causes congested blood flow towards distant parts of the body and is brought to dilate blood vessels (Schleinkofer, 2005).

Need for the Study

A study from emergency department in Nottingham reveals that, 32% of the 1,20,000 annual total attendance were for children. Febrile illness was, second most common medical reason for attendance, accounting for 20% of such cases. On children's wards, at least 48% of admissions are associated with infection. Most of these infections present with a feverish illness with or without other symptoms such as breathing difficulty, fits, rash or cough. Feverish illness is the most common presenting problem leading to acute hospital admission in childhood (Semen's, 2008)

Emergent management of pediatric patients with fever is a common challenge. Children with fever account for as many as 20% of pediatric emergency department (ED) visits, and the underlying disorder in these cases range from mild conditions to the most serious of bacterial and viral illnesses (John, W Graneto, 2011).

The incidence of hospital-acquired fever ranged from 2% to 17%. Fever was attributed to infection in 37% to 74% patients, whereas a noninfectious etiology was identified in 3% to 52% (Rob Smyth, 2011).

External cooling is the treatment of choice for hyperthermia. In contrast to fever, hyperthermia is characterized by a core temperature that exceeds the thermoregulatory set point. During fever, cutaneous vasoconstriction and behavioural response raise more temperature to coincide with an elevated thermal set point dictated by, the action of endogenous pyogens in thermoregulatory set point. So during hyperthermia, decreased heat production, vasodilatation, sweating and behavioral cooling responses work to lower body temperature. Thus when external cooling is used to treat hyperthermia, it is not opposed by the counter regulatory processes that are evoked by the use of such treatment for fever (Weiner, 2009).

Canadian pediatric society of hazardous substance committee in (2008) report stated that paracetamol, is safer among all other antipyretics drugs in reducing fever. The most serious side effect of this drug is hepatotoxicity. There has been reported severe hepatotoxicity among children receiving paracetamol in dosages as low as 147-152mg/kg/day when taken for 1-4days.

Other literature identified 6 out of total 47 cases of hepatotoxicity where the child had received 100 mg/kg/day or less of acetaminophen. These suggest that therapeutic dose of paracetamol is close to toxic dose and this means that despite being one of the recommended doses there are chance for chance for overdose and toxicity, even severe complications.

Tepid sponging leads to vasoconstriction, which can result in a further rise in a child's temperature if performed too quickly, sponging can cause a child to shiver and have an increase in metabolic rate. This will subsequently increase the child's temperature where a lukewarm bath may help a child feel more comfortable and soothed, particularly if their parents can give the bath. However, the water temperature should not induce shivering and helps to reduce the body temperature through vasodilatation (Kathy Bridgwater, 2006).

The hot sponge bath is provided on a patient with a very high fever and whose legs and arms are cold. As much as possible the water used should be as hot as can be tolerated by. Perform the hot sponge bath as fast as you can and with friction to enhance blood circulation. The hot sponge bath maybe performed at an interval of two hours if the fever doesn't subside (Emilgen, 2011)

Sponging with tepid water only as an emergency measure to lower the temperature of at least 41°C. The reason is that if the set point is not first lowered by antipyretic drugs, external cooling increases metabolic rate, shivering and discomfort can result in 'rebound' temperature elevation after sponging. (Sloane and Slat, 2007).

Fever is the first sign following and infection. Many methods are used in reducing fever. Among the non-pharmacological measures, most commonly used method to reduce fever is sponge bath. Sponging the child with tepid and cold water have been routinely used in treatment of fever for a long period of time. But the major problem is that they may cause additional discomfort like shivering, excessive crying and may even have chance of further cause rise in temperature. Still these methods are routinely used in many hospitals in management of fever along with antipyretics. This can be

managed by the use of hot or warm water application, especially warm water application which reduces fever by improving the blood circulation by vasodilatation there by increasing the heat lose. So studies need to be conducted about the temperature of water that needs to be used for sponging considering the comfort of child with fever. So researcher felt the need for compare whether effect of worm of tepid sponging causes fastest reduction of temperature and maintain comfort of child.

Statement of the Problem

A comparative study to assess the effectiveness of Warm and Tepid Sponging in Reducing Hyperthermia among Children between the age group of 1-6 years in Ashwin Hospital, Coimbatore.

Objectives of the Study

- To assess the level of body temperature before and after warm sponging among children belonging to Experimental Group I
- To assess the level of body temperature before and after tepid sponging among children belonging to Experimental Group II
- To compare the effectiveness of warm and tepid sponging in reducing hyperthermia among children in Experimental group I and experimental group II
- To associate the effectiveness of warm sponging in reducing hyperthermia with selected demographic variables
- To associate the effectiveness of tepid sponging in reducing hyperthermia with selected demographic variables

Hypothesis

There is significant difference between the effects of warm and tepid sponging in minimizing Hyperthermia.

Operational Definitions

Assess

It refers to Valuation or Judgement on the effectiveness of tepid and warm sponging.

Effectiveness

It refers to the extent to which application of warm and tepid sponging has achieved and desired effect in reducing hyperthermia.

Sponging

A bath in which the bather is cleaned by a wet sponge dipped in water without getting into a tub of water.

Tepid Sponging

Tepid sponging means body is rubbed with lukewarm water, or tepid water, not hot but not cold, (85-93.2°F/30-34°C).

Warm Sponging

The body is rubbed with a wet or sponge cloth for a period of 15 – 20 minutes using warm water with temperature ranges between 37-40.5°C / 98.6-105°F.

Hyperthermia

An increase in body temperature over the bodies thermoregulatory set point, due to excessive heat production and or insufficient thermo regulation, (101°F to 104°F as measured orally using a digital thermometer)

Children

It refers to those who are admitted in the hospital between the age group of 1-6 years with hyperthermia.

Assumptions

- Warm sponging and tepid sponging will reduce the fever level among children
- Warm sponging will be more effective in reducing hyperthermia than tepid sponging
- Application of warm sponging will be more comfortable for children.
- Education on the practice of warm sponging during fever will improve the knowledge and practice among children with fever.

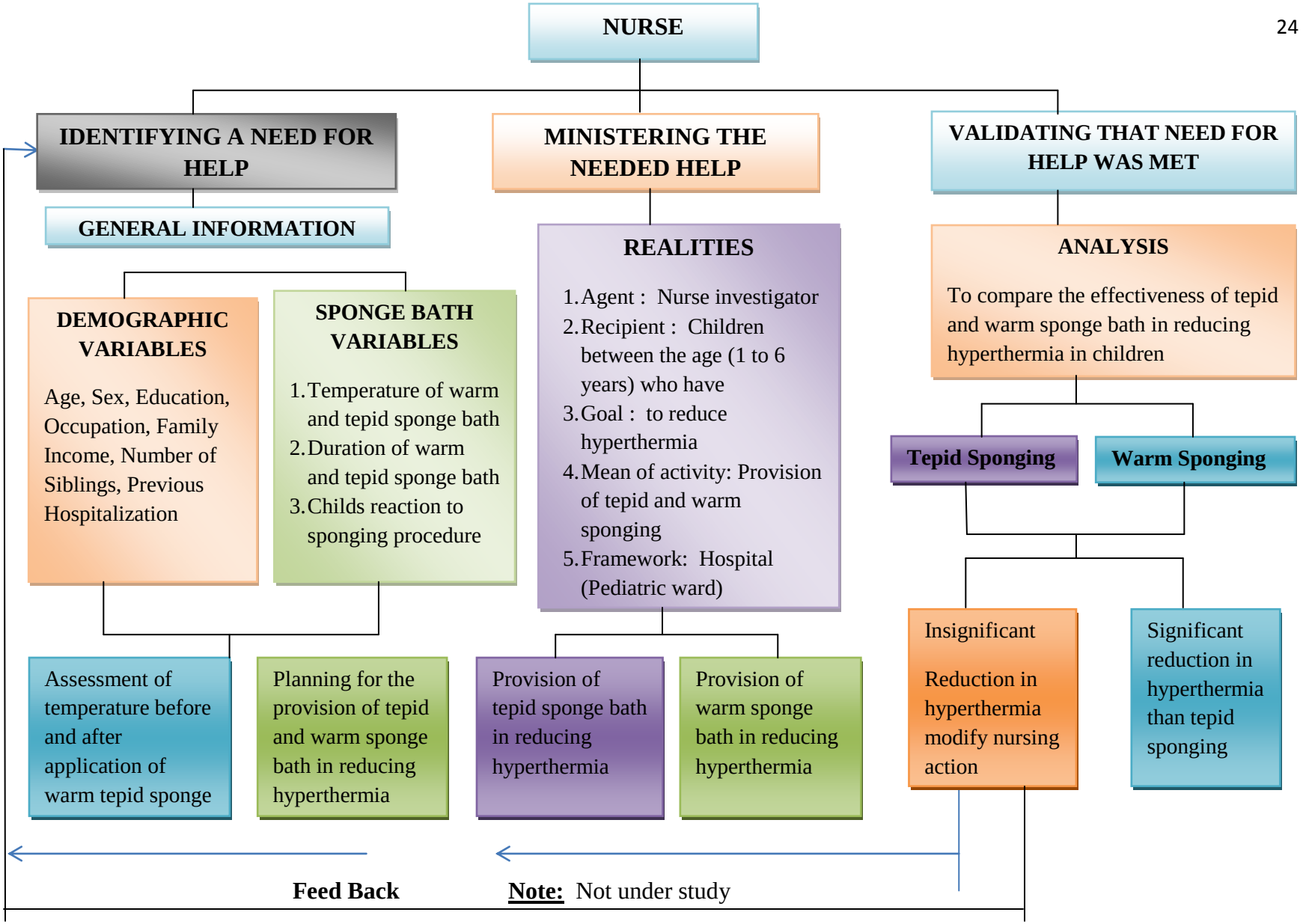


Figure. 1 Conceptual Framework Based on Modified Wiedenbach's Helping Art of Clinical Nursing Theory (1964)

CHAPTER – II

Review of Literature

Best (1982) describes a brief summary of previous research findings and writings of recognized experts provides evidence that the researcher is familiar with what is already known and with what is still unknown and interested.

Review of literature involves systematic identification, location, scrutiny, and summary of written materials that contain information on research problem. The literature review is based on an extensive survey of book, journals and international nursing index. Research and non-research literature were reviewed to broaden the understanding and gain insight into the problem under study.

The Related Review of Literature has been organized under the following Headings.

- Literature related to Fever
- Literature related to causes and risk factors of Fever.
- Literature related to management of Fever
- Literature related to effectiveness of warm water sponging in reduction of Hyperthermia
- Literature related to effectiveness of tepid sponging in reduction of Hyperthermia.

Literature related to Fever

Parul Dutta (2014) stated that the fever or pyrexia is the elevation of body temperature above normal i.e. 37° C or 98.4° F. It is very common health problem in children. It is a symptom related to various disease conditions. There are variations in increased body temperature. Pyrexia is classified as the following low pyrexia 31.1° C to 38.4° C (99° F ± 101° F), moderate pyrexia 38.4° C to 39.5°C (101° F ± 103°F) high pyrexia 39.5 to 40.6 C (103 °F ± 105 °F, hyper pyrexia above 40.6 °C (105° F). The causes of fever in children were dehydration, excessive dieresis, hot environment and evening time of the day,

excitement and exaction, injury or disturbance of hypothalamus or brain, side effects of drugs, toxins, vaccines, chemical substances, and some disease conditions like leukemia, systemic lupus erythematosus, tuberculosis andrheumatic fever.

Reduction of body temperature is the vital aspect, of the management, it can be done by giving tepid sponge, applying ice bag or farming is cool airy environment with good ventilation and warm water foot bath therapy. Provision of rest and comfort to reduce metabolic rate and allowing more oral fluids to prevent dehydration are important supportive measures. Light liquid and easily digestible high caloric diet to be planned according to Childs condition. Maintenance of personal hygiene especially, special mouth care, care of skin and loose absorbent cotton clothing are essential.

Pubmed (2010) stated that the fever is a common childhood problem faced by health care personnel including doctors, nurses and others in both hospital and community settings. However, the nursing management of fever in children is often not based on research and remains inconsistent in practice. Several methods have been recommended to reduce fever in children, which include tepid sponging, fanning, alcohol sponging and antipyretics. However, controversy surrounds the use of tepid sponge for reduction of fever. The effectiveness of tepid sponging as a treatment alongside antipyretic varies between studies, with some finding that it is of no benefit and others suggesting that it is helpful. There is dearth of related studies in India.

Wong's (2010) stated that an elevated temperature most frequently from fever but occasionally caused by hyperthermia is one of the most common symptoms of illness in children. The manifestation is of great concern to parents. Body temperature is regulated by a thermostatic mechanism in the hypothalamus. This mechanism receives input from centrally and peripherally located receptors. When temperature changes occur, these receptors relay the information to the thermostat, which increase or degrees heat production to maintain a constant set point temperature.

However, during an infection, a process that is mediated by prostaglandins, the hypothalamus increases heat production until the core temperature reaches the new set point. The principal reason for treating fever is the relief of discomfort. Relief measures include pharmacologic or environmental intervention. The most effective intervention is the use of antipyretics to lower the set point. Traditional cooling measures, such as wearing minimum clothing, exposing the skin to the air, reducing room temperature, increasing air circulation, and applying cool, moist compresses are effective if employed approximately 1 hour after an antipyretic is given so that the set point is lowered. Cooling procedures such as sponging or tepid baths and hot therapy such as warm water foot bath therapy are also used to maintain normal body temperature.

O.P.GHAI (2009) Stated that the fever is increase in body temperature over the normal values for an individual. The normal body temperature children are higher as compared to adult's exhibits a normal children thermal variation and varies between 36.1° C to 37.8 °C (97° F -100° F) on rectal measurement. There is a normal diurnal variation in the body temperature, it is lowest between 0 and 0600 hours and maximum between 1700 and 1900 hours. The core body temperature can be measured at several sites including the oral cavity, auxiliary, rectal, and ear canal and over the temporal. The rectal method is the most accurate method for measurement of temperature and fever is defined of rectal temperature of more than 38° C or 100.4° F, in children below the age of 4-5 years, the auxiliary temperature is on an average 0.5-10° C or 1-20° F lower than the rectal temperature more than 37.2° C or 99° F, in the children above the age of 4-5 years the oral method is suitable, the oral temperature is an average 0.5-10° F or 0.25-0.50 lower than rectal temperature. Fever is a symptom;therefore treatment of the undertaking cause is important. Tepid water sponging may be used as a complementary method to drug therapy in bringing down fever in some children.

Parthasarathy (2009) stated that the fever in children is one of the most common manifestations of an illness, which makes the parents seek medical attention early. Fever occurs when various infections and non-infectious

processes interact with the host's defense mechanism. It is important that all children with fever are carefully assessed to find the cause. The normal body temperature is maintained between a range of 36.8 + 0.4C (98.2 + 0.7° F) with a circulation rhythm of lowest temp at 6.00 am (37.2° C or 98.9° F) and highest temperature of 37.7 °C or 99.9 °F at 4.00 pm. In general fever is considered to be present if rectal temperature is above 38.3° C, oral temp is above 37.8° C or auxiliary temperature is above 37 °C.

Ronne (2009) stated that fever as any elevation of body temperature above 38°C . Infancy body temperature should be measured rectal. Fever is mostly caused by a viral infection, but it can be an indicator of a major illness such as meningitis, septicemia, and pneumonia.

Taylor, Lillis (2008) Stated that fever increase above normal (Considered to be 37.0° C or 98.6° F) in body temperature. A person with a fever is said to be febrile. Fever occurs in response to an optimum displacement of the thermo regulatory set point crypto kinase produced by pyogens (microorganism or substances that cause fever). Although the purpose of fever is not finally understood, it signals infection and increases immune function. The onset of fever which can be sudden or gradual typically is more rapid in children than in adults. The mild elevation in temperature might indicate a serious infection in infants younger than 3 months of age as they do not have well developed temperature control mechanisms. The hypothalamus initiates temperature rising mechanisms, shivering, vasoconstriction, and increased metabolism. Patients with fever may experience loss of appetite, headache, hot flushed face, thirst muscle aches, and fatigue.

Barton (2007) conducted a study regarding Parent's understanding of fever. All parents were inappropriately worked about low-grade fever, with temperatures of 38.9°C or less. Most parents (52%) believed that fever with a temperature of 40°C or less could cause serious neurological side effects. As a result, almost all parents in the study treated fever aggressively. Parents considered a temperature of 37.9°C to be mild fever, 39.1°C to be high fever and 39.9°C to be dangerous fever.

Wilson (2007) conducted a study on morbidity in general practice, which included nearly 10,000 children, the annual consultations rates for infections were 60% of the population aged less than 12 months, 36% aged 1-4 years and 20% aged 5 – 15 years. Not surprisingly, fever in children is also a common reason for seeking health advice.

Literature related to causes and risk factors of Fever

Sharber (2011) in a study of 1% of the national child population, the mean general practice (GP) consultation rate was 3.7 per child per year and almost double that rate for children aged under 4 years. Infections and respiratory disorders made up over 40% of the consultation.

Rurssell (2007) stated that causes of high fever vary, and include such relatively routine conditions as sore throat, sinusitis, and urinary tract and other infections. Some causes may be more serious and include such conditions as appendicitis and pneumonia. In rare cases, high fever can occur without any infection as a result of arthritis, lupus, or certain gastrointestinal and vascular disorders.

Script (2007) reported that multiple types of infections, inflammatory disorders and conditions can lead to a fever. More common infection include flu (influenza), pneumonia, appendicitis and urinary tract infections, rheumatoid arthritis and other connective tissue inflammatory conditions can also be present with a fever.

Daniel R Kaul (2006) report that the incidence of hospital-acquired fever ranged from 2% to 17%. Fever was attributed to infection in 37% to 74% of patients, whereas a noninfectious etiology was identified in 3% to 52%. The most common infectious causes included urinary tract infection, pneumonia, sinusitis, and bloodstream infection. The most common noninfectious causes

were procedure related (e.g., blood transfusion), malignancies, and ischemic conditions (e.g., myocardial infarction, pulmonary embolism).

Literature related to management of Fever

Axelrod (2009) conducted a study to describe the epidemiology, management and outcomes of children with fever in pediatric primary care practice. Among 3819 initial visits of an illness episode, 41% of children had diagnosed bacterial or specific viral source. Of these 13% with a temperature of 38°C and 30% with a body temperature of greater than or equal to 39°C received laboratory testing. The majority of febrile children in ambulatory settings were diagnosed with a bacterial infection and treated with an antibiotic.

Purssell. E (2007) stated that although antipyretic drugs are the main form of treatment for fever. Physical treatments such as tepid sponging, removing clothing and cooling the environment helps in further reduction of temperature among the febrile children. So paracetamol along with these physical methods helps in the fastest reduction of fever.

Hockenberg (2007) reported that it is the blood that heals. Blood that maintains the heat of the body destroys disease germs and repairs the diseased or injured portions of the body, that is diseased should be to secure an active circulation of the blood through that part. The circulation of the blood in any part of the body can be controlled by the use of hot and cold water. The hot application causes the blood vessels to dilate or enlarge in the part of the body where the heat has been applied. If cold is then applied, the dilated blood vessels will contract. As they contract, the blood is forced out into the blood vessels in other parts of the body.

Literature related to effectiveness of warm water sponging in reduction of Hyperthermia

Selvakumari (2011) conducted a study hospital based study among 30 patients who got admitted with fever ranging from 37.8°C to 39.4°C, were selected and

given hot water foot bath for about 15 minutes and temperature assessed by clinical thermometer. The result showed significant reduction of temperature after application of hot water foot bath with a mea difference of 2.21°F. The mechanism is that application of warm water causes veins to expand which improving the blood circulation, there by transferring the heat from highest heat area to lower heat area.

Clinthera, 2009, Children who are afebrile when seen by the clinician but are reported to have had fever by their caregivers should be considered febrile. In special circumstances, high fever may be a predictive factor for severe bacterial infection. Use of physical methods of reducing fever is discouraged, except in the case of hyperthermia. Use of antipyretics—paracetamol (acetaminophen) or ibuprofen—is recommended only when fever is associated with discomfort. Combined or alternating use of antipyretics is discouraged. The dose of antipyretic should be based on the child's weight rather than age. Whenever possible, oral administration of paracetamol is preferable to rectal administration. Use of ibuprofen is not recommended in febrile children with chickenpox or dehydration. Use of ibuprofen or paracetamol is not contraindicated in febrile children with asthma. There is insufficient evidence to form any recommendations concerning fever in children with other chronic conditions, but caution is advised in cases of severe hepatic or renal failure or severe malnutrition. Newborns with fever should always be hospitalized because of the elevated risk of severe disease; paracetamol may be used, with the dose adjusted to gestational age. Use of paracetamol or ibuprofen is not effective in preventing febrile convulsion or the adverse effects of vaccines.

Leung.Luk, et al.m (2008) conducted a cross sectional descriptive study to examine the fever management practice among pediatric nurse in three Hong Kong hospitals by using questioners, a total of 121 questioners were send to nurses, 83.9% responded that there are nursing protocols or guidelines available in there hospital unit for fever management. the most commonly done nursing measures they follow for fever management includes removal of clothing 100% encouraging fluid intake 99.1% warm sponging 89.4% tepid sponging 76.1% icepack 69.9% keeping the room cooler 38.8% use of fan 9.7% and cool bathing 5.3% the findings is that warm sponging is

the procedure that is followed in every hospitals in Hong Kong, when compared to tepid sponging and has written protocol and guidelines.

Dougall .A, et al., (2006) conducted a study regarding the efficacy of 3 interventions that is antipyretic alone, antipyretic and sponging group and sponging alone in lowering body temperature with rectal temperature higher than 38.9°C among 73 children. there was no difference between groups after 30 minutes and at 60 minute, temperature reduction was greater in acetaminophen alone group than sponging only group. the reduction of temperature was greater in acetaminophen with sponging than acetaminophen alone and sponging alone group.

Kinmonth. AL. et al., (2006) conducted a randomized, open, parallel study to compare unwrapping, warm sponging plus unwrapping, paracetamol plus, unwrapping and paracetamol and warm sponging plus unwrapping on fever reduction among 52 children aged from 3 months to 5 years with axillary temperatures before treatment of 37.8°C - 40°C. The result of the study showed that, unwrapping alone had little effect; paracetamol decreased the temperature below 37.2°C in 4 hours compared with unwrapping, warm sponging caused the fastest reduction in temperature. Warm sponging has an additive effect and reduces fever more quickly than paracetamol.

Literature Related to Effectiveness of Tepid water sponging in Reduction of Hyperthermia

Bakiler (2009) conducted a study on tepid sponging alone, sponging with medication like aspirin, or paracetamol, or ibuprofen in equal dose (15mg/kg). 224 children aged 6 months to 5 years, with rectal temperatures greater than or equal to 30°C (104°F) was given treatment. During the first 30 min of intervention, sponging was found to be more effective than all of the three medications. After 60 min, the effects of each medication became superior to sponging with tepid water in reducing body temperature. For the management of fever over 30°C, it is therefore recommended to give children an antipyretic

drug and at the same time to begin sponging to provide a rapid and sustained antipyretics.

Gemmill (2009) conducted a study to compare the efficacy of tepid sponging with the use of paracetamol among 80 feverish children between the age group of 0 – 54 months. A significantly greater and more rapid reduction of fever was demonstrated with paracetamol than tepid sponging. The study concluded that tepid sponging alone can be effective to reduce fever only for a maximum period of 30 minutes.

Almeida. CD, et al., (2008) conducted a randomized controlled study among 150 children to compare the effectiveness of tepid sponging and antipyretic drug and antipyretic drug alone between the age group of 6 months to 12 years of age with axillary temperature 101°F and above. The reduction of body temperature in the tepid sponging and antipyretic drug group was significantly faster than only antipyretic group; however, by the end of 2 hours both groups had reached the same degree of temperature. Apart from the initial rapid temperature reduction, addition of tepid a ponging to antipyretic administration does not offer any advantage in ultimate reduction of temperature; moreover it may result in additional discomfort.

Sao Paulo Medical Journal (2008) published that in a randomized clinical trial on treatment of fever, children between 6 months to 5 years old with axillary temperature greater than 38°C admitted in emergency ward. 120 children were randomly assigned to receive oral dipyrone, oral dipyrone and tepid sponging for 15 minutes and assessed at an interval of 15, 30, 60, 90 and 120 minutes. The study concluded after the first 15 minutes, the fall in axillary temperature was significantly greater in the sponged group than in the control group. From 30 to 120 minutes, better fever control was observed in the control group. Crying and irritability were observed respectively in 52% and 36% of the sponged children and in none and only two of the controls.

Graham (2008) conducted a study to compare the efficacy of tepid sponging with the use of paracetamol in febrile children. 80 children between the age group of 6 to 54 months with auxiliary temperatures range between

38.5°C to 40°C receive either oral paracetamol (15mg/kg) or tepid sponging. Axillary temperature and assessment of discomfort were recorded every 30 minutes for 2 hours. The study concluded that tepid sponging without antipyretics is often used to reduce fever, but is effective only during the 1st 30 minutes. Paracetamol is rapidly more effective than tepid sponging in reducing body temperature in febrile children.

Sharber (2008) conducted a randomized study on the effect of antipyretic alone, tepid sponging plus antipyretics alone in reducing fever. 20 children, aged between 5 months to 68 months with fever of 38.9°C or greater were chosen for the study. Tympanic temperature was monitored every 30 minutes for 2 hours. Subjects were monitored for signs of discomfort. The study concluded that sponge-bathed subjects cooled faster during the first hour, but there was no significant temperature difference between the groups over the two hour study period. Subjects in the sponge bath group had significantly higher discomfort.

Friedman (2007) conducted a study to find out the efficiency of tepid sponging alone, paracetamol plus tepid sponging and paracetamol alone among 78 children with fever. The study showed, greatest temperature reduction in combined acetaminophen plus sponging group and the smallest temperature reduction were noted in children who received sponging alone.

Sloane and Slatt (2006) suggested tepid water sponging only as an emergency measure to lower a temperature of at least 40°C. The reason is that if the set point is not first lowered by antipyretic drug, external cooling increases the metabolic rate, shivering anddiscomfort can result in rebound temperature elevation after sponging.

Conceptual Framework

Conceptual Framework, deals with abstractions that are assembled by the virtue of their relevance to the common theme. Purpose of conceptual framework is to organize a concept that represents essential knowledge that might be used by many disciplines.

The research study is based on to determine the effectiveness of tepid/warm sponging in reducing hyperthermia. This study is aimed at helping the children who have hyperthermia by applying warm or tepid sponging. Hence the study is based on Ernestine Wiedenbach's Helping Art of Clinical Nursing Theory (1964).

According to Wiedenbach, Nursing is an art based on goal directed care. It consists of 3 steps.

→ Identification of a need for help
→ Ministering the needed help
→ Validating that need for help was met

Step 1: Identification of a need for help

Here the nurse explores with the child having hyperthermia. It includes the following components.

General information

This comprises of the demographic variables

Central purpose

Central purpose is to reduce hyperthermia

Prescription

It includes nursing interventions prescribed to meet the central purpose, i.e., applications of Warm and Tepid sponging in reducing Hyperthermia.

Step 2: Ministering the Needed Help

Ministration is providing the needed help. It requires the identification of the need for help, the selection of a helping measure appropriate to that

need and acceptability by the child, tepid and warm sponging for child who have hyperthermia. Here the nurse formulates a plan and with mothers acceptance implements the plan. This includes two components called reality which is use of warm and tepid sponging in reducing hyperthermia. The reality has four components.

Agent

The agent is the practicing nurse or a designee who has the personal attributes, capacities and competence to provide nursing care. Here the agent was nurse investigator.

Recipient

The child who fulfills the inclusion and exclusion criteria will be accepted as recipient needing help.

Goal

Is the nurse desired outcome. Here the goal was to reduce the hyperthermia.

Means

Are the activities and devices used by nurse to achieve the goal. Here the nurse investigator used procedures Tepid and warm sponging in reducing Hyperthermia.

Frame Work

It refers to the facilities in which nursing care is practiced. Here the frame work was Ashwin Hospital, Coimbatore.

Step 3:

It validates the needed help what delivered in achieving the central purpose. This involves the post assessment done after ministering help and

comparison and analysis was done to make suitable decision and recommendation action either continue or modify the nursing action to improve the outcome. Statistically proved that warm sponging is effective than tepid sponging in reducing hyperthermia in children.

CHAPTER – III

Methodology

Methodology of the study indicates the general pattern of the research approach and research design that includes the steps of procedures, strategies and analyzing the data in the investigation. In this section, the researcher discusses the research approach, research design, and setting of the study, sample size, sampling technique and criteria for selection of the sample, description of the tool, content validity, reliability, pilot study, data collection procedures, and plan for data analysis.

Research Approach

Comparative experimental research approach was considered to be the most appropriate to achieve the objectives of this study.

Research Design

The Research Design provides an overall plan for conducting the study. The research design helps the researcher in the selection of the topic, manipulation of experimental variables, procedure for data collection and the type of statistical analysis to be used to interpret the data.

Two group pretest and posttest design was adapted for both Experimental Group I and Experimental group II. After the assessment of effectiveness of warm sponging in Experimental Group I and Tepid sponging in Experimental Group II, the posttest values were compared.

Group I O_1 X_1 O_2

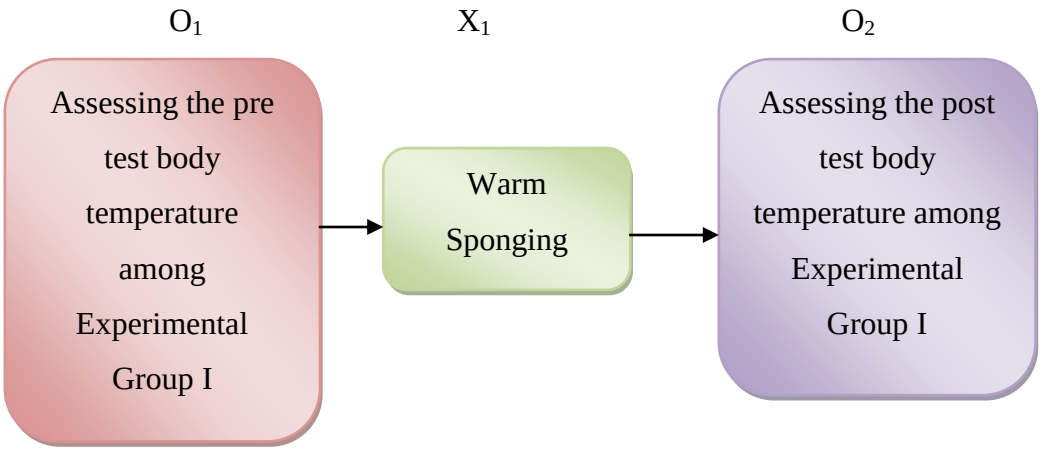
Group II O_1 X_2 O_2

O_1 – Pretest Assessment

O_2 – Post test Assessment

X_1 – Application of Warm sponging

X_2 – Application of Tepid sponging



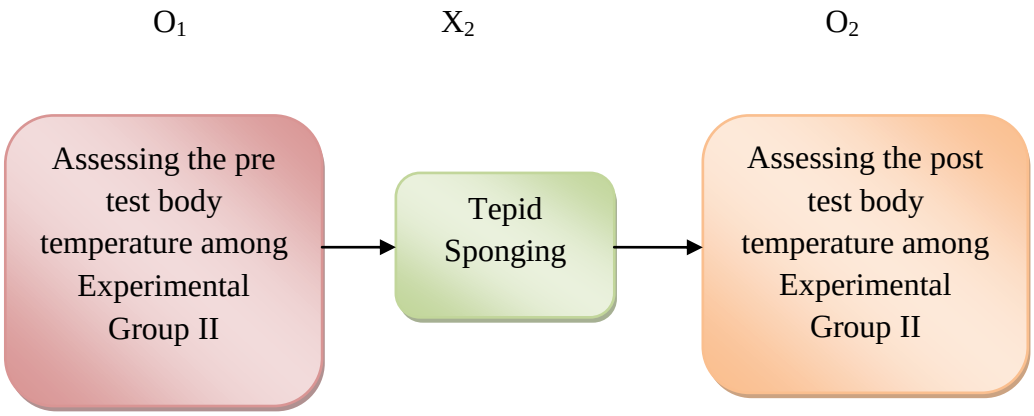


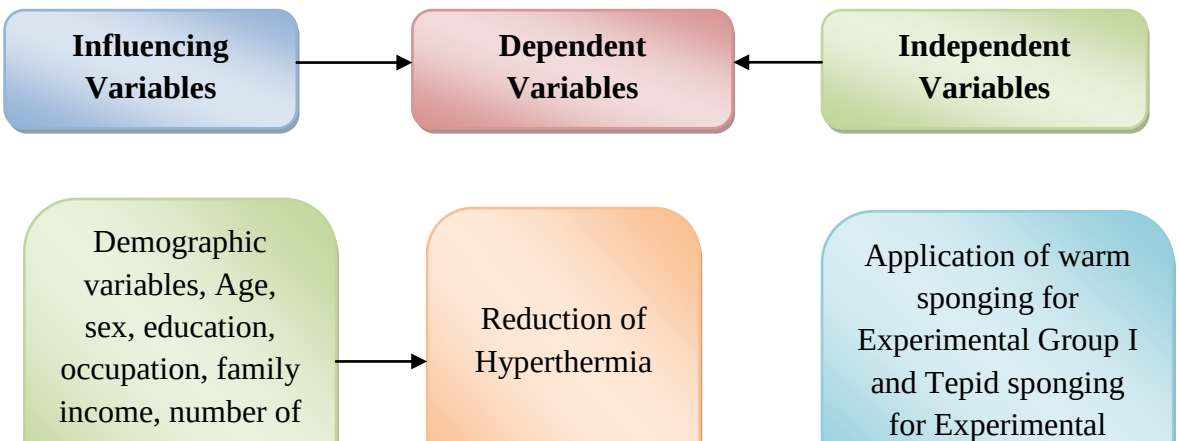
Figure: 2 The Schematic Representation of the Study Design

Setting of the Study

The study was conducted in Ashwin Hospital, Coimbatore.

Variables

Independent variables were application of warm sponging for Experimental Group I and Tepid Sponging for Experimental Group II. The dependent variable was reduction of hyperthermia. Influencing variables were demographic variables.



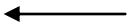


Figure : 3 The Schematic representation of the Variables

Population

The population of the study includes children between the age group of 1-6 years with hyperthermia (101-104°F) admitted in Ashwin Hospital, during the data collection period of one month.

Sample Size

The sample size included for the study consist of 50 samples, out of which 25 children belong to Experimental Group I and 25 children belong to Experimental Group II.

Sampling Technique

Purposive sampling technique was used for selection of samples from the population of the study.

Criteria for the Selection of Sample

Inclusive Criteria

- Hospitalized children with fever ranging from 101 - 104°F.
- Children in the age group of 1 – 6 years

- Children receiving only antipyretics and no other physical or external measures for lowering body temperature
- Children those who are co-operative during the intervention
- Children of mothers giving consent for the intervention

Exclusive Criteria

- Children who develop rigor before or during intervention
- Children those who are contraindicated for sponging like, burns, head injury, septicemia, open wounds etc.
- Children who are unconscious
- Children who are seriously ill.

Description of Tool

The tool consists of the demographic data, and temperature recording data sheet to assess the temperature by using Digital Thermometer.

Section – A Description of Demographic Variables

It includes age, sex, education, residential area, type of family, family income, number of siblings and history of previous hospitalization.

Section – B The Data Sheet

Temperature recording data sheet was used in the study.

S. No	Pretest Temperature	Data Sheet Post Test Temperature				
		0 minutes	15 minutes	30 minutes	45 minutes	Remarks

Testing of the Tool

Content Validity

The tool was given to five experts in the field of pediatric nursing for content validity. All the comment and suggestions given by the experts were duly considered and correction was made after discussion with the research guide.

Reliability

The tool used in the present study was standardized hence reliable.

Pilot Study

After getting permission from the respective authorities, pilot study was conducted among 10 children with hyperthermia at Ashwin Hospital, Coimbatore for a period of one week. Among these 5 children with hyperthermia, were selected as Experimental Group I and other 5 children were selected as Experimental Group II. Pretest was conducted using temperature recording data sheet and assessed by using digital thermometer.

After the pretest, Warm sponging was given to experimental group I and Tepid Sponging was given to Experimental Group II. The post test degree of temperature was assessed by using temperature recording data sheet, and digital thermometer. The results of pilot study showed that there was significant reduction in body temperature after giving sponging in both groups and children receiving warm sponging were more comfortable when compared to tepid sponging.

Data Collection Procedure

After getting official acceptance from the honorable principal and experts to go on with the present study, formal permission was obtained from the Ashwin Hospital, Coimbatore.

The study was conducted for a period of one month. The samples were selected as per the inclusive criteria. The purpose of the study was explained to the identified mothers of the children. The commencement of the study was informed to physician and in-charge nurse, the baseline demographic data was obtained by interview schedule. The degrees of temperature were assessed by using digital thermometer. After assessing the temperature, Warm Sponging was given to the children with fever among Experimental Group I and Tepid sponging was given to children with fever among Experimental Group II for 10 – 15 minutes. The post test level of temperature were assessed in 0, 15, 30, 45 minutes by using digital thermometer and recorded in the temperature recording data sheet.

Plan for Data Analysis

The investigator adopted descriptive and inferential statistics to analyze the data. The demographic variables were analyzed by using frequency and percentage. The effectiveness of Warm and Tepid sponging in reducing hyperthermia were analyzed by using paired 't' test. Then posttest values of both Warm and Tepid sponging values were compared by using independent 't' test and association between the variables were analyzed using chi-square test.

CHAPTER – IV

Data Analysis and Interpretation

This chapter deals with analysis and interpretation of the data collected from children with Hyperthermia at Ashwin Hospital, Coimbatore, regarding the effectiveness of warm and tepid sponging in reducing Hyperthermia.

The findings based on the descriptive and inferential statistical analysis were presented under the following headings.

Section I : Distribution of demographic variables of Experimental group I and Experimental group II

Section II : Distribution of statistical value of hyperthermia before and after application of

Warm and Tepid sponging for children belonging to Experimental group I and

Experimental groupII respectively.

Section III: Comparison of statistical values of hyperthermia between the Experimental group I and Experimental group II.

Section IV : Association of selected demographic variables with post test score of

Hyperthermia among children belonging to Experimental group II.

SECTION - I

Table: 1 Distribution of demographic variables of Experimental group I and Experimental group II.

(N= 50)

S.No	Demographic Variables	Experimental Group I	Experimental Group II

		Frequency (f)	Percentage (%)	Frequency (f)	Percentage (%)
1	**Age in Years**				
	a) 1 - 2 years	12	48	8	32
	b) 3 – 4 years	7	28	9	36
	c) 5 – 6 years	6	24	8	32
2	**Sex**				
	a) Male	15	60	11	44
	b) Female	10	40	14	56
3	**Education**				
	a) Below I standard	8	32	7	28
	b) I standard	11	44	8	32
	c) II standard	6	24	10	40
4	**Residential Area**				
	a) Rural	13	52	12	48
	b) Urban	12	48	13	52
5	**Type of Family**				
	a) Nuclear	15	60	16	64
	b) Joint	10	40	9	36

(Table 1 Continues)

(Table 1 Continued)

S.No	Demographic Variables	Experimental Group I		Experimental Group II	
		Frequency (f)	Percentage (%)	Frequency (f)	Percentage (%)
6	**Family Monthly Income**				
	a) Below Rs. 5,000	7	28	9	36

	b) Rs. 5,001 – 7,500	6	24	6	24
	c) Rs. 7,501 – 10,000	7	28	7	28
	d) Rs. 10,001 and above	5	20	3	12
7	**Total number of siblings**				
	a) No siblings	7	28	8	32
	b) One	9	36	10	40
	c) Two	6	24	6	24
	d) More than two	3	12	1	4
8.	**History of Previous Hospitalization**	14	56	13	52
	a) Yes	11	44	12	48
	b) No				

Table 1 reveals distribution of demographic variables of the children with Hyperthermia belonging to Experimental group I and Experimental group II.

- In Experimental group I, regarding the age of children, 12 (48%) were in the age group of 1-2 years, 7(28%) were in the age group of 3-4 years, 6(24%) were in the age group of 5 – 6 years. In Experimental group II regarding the age of children, 8 (32%) were in the age group of 1 – 2 years, 9 (36%) were in the age group of 3 – 4 years, 8 (32%) were in the age group of 5 – 6 years.

- In Experimental group I, with regards to sex of children 15(60%) were males, 10 (40%) were females. In Experimental group II with regards to sex of children 11(44%) were males, 14(56%) were females.

- In Experimental group I, with regards to educational status of the children 8 (32%) were below Ist standard, 11 (44%) were in Ist standard, 6(24%) were in IInd standard. In Experimental group II with regards to educational status of the children 7 (28%) were below Ist standard, 8(34%) were in Ist standard, 10(40%) were in IInd standard.

- In Experimental group I, regarding residential area 13 (52%) were in rural area, 12 (48%) were in urban area. In Experimental group II regarding residential area 12 (48%) were in rural area, 13 (52%) were in urban area.

- In Experimental group I, regarding type of family 15(60%) were in nuclear family, 10 (40%) were in joint family. In Experimental group II, regarding type of family 16(64%) were in nuclear family, 9 (36%) were in joint family.
- In Experimental group I, with regards of family income per month, 7 (28%) were belongs to below Rs. 5,000 per month, 6 (24%) were between the range of Rs. 5001 – 7,500 per month, 7 (28%) were between the range of Rs. 7501 – 10000, and 5(20%) belongs to Rs.10001 per month and above. In Experimental group II, with regards of family income per month, 9(36%) were belongs to below Rs. 5,000 per month, 6 (24%) were between the range of Rs. 5001 – 7500 per month, 7 (28%) were between the range of Rs. 7501 – 10000, and 3(12%) belongs to Rs. 10001 per month and above.

- In Experimental group I, regarding total number of siblings, 7 (28%) were no children, 9 (36%) were having one siblings, 6(24%) were having two siblings, 3(12%) were having more than two siblings. In Experimental group II, regarding total number of siblings, 8(32%) were no children, 10 (40%) were having one siblings, 6(24%) were having two siblings, 1(4%) were having more than two siblings.
- In Experimental group I, regarding history of hospitalization, 14(56%) were having history of hospitalization, 11 (44%) were not having history of hospitalization. In Experimental group II, regarding history of hospitalization, 13(52%) were having history of hospitalization, 12 (48%) were not having history of hospitalization.

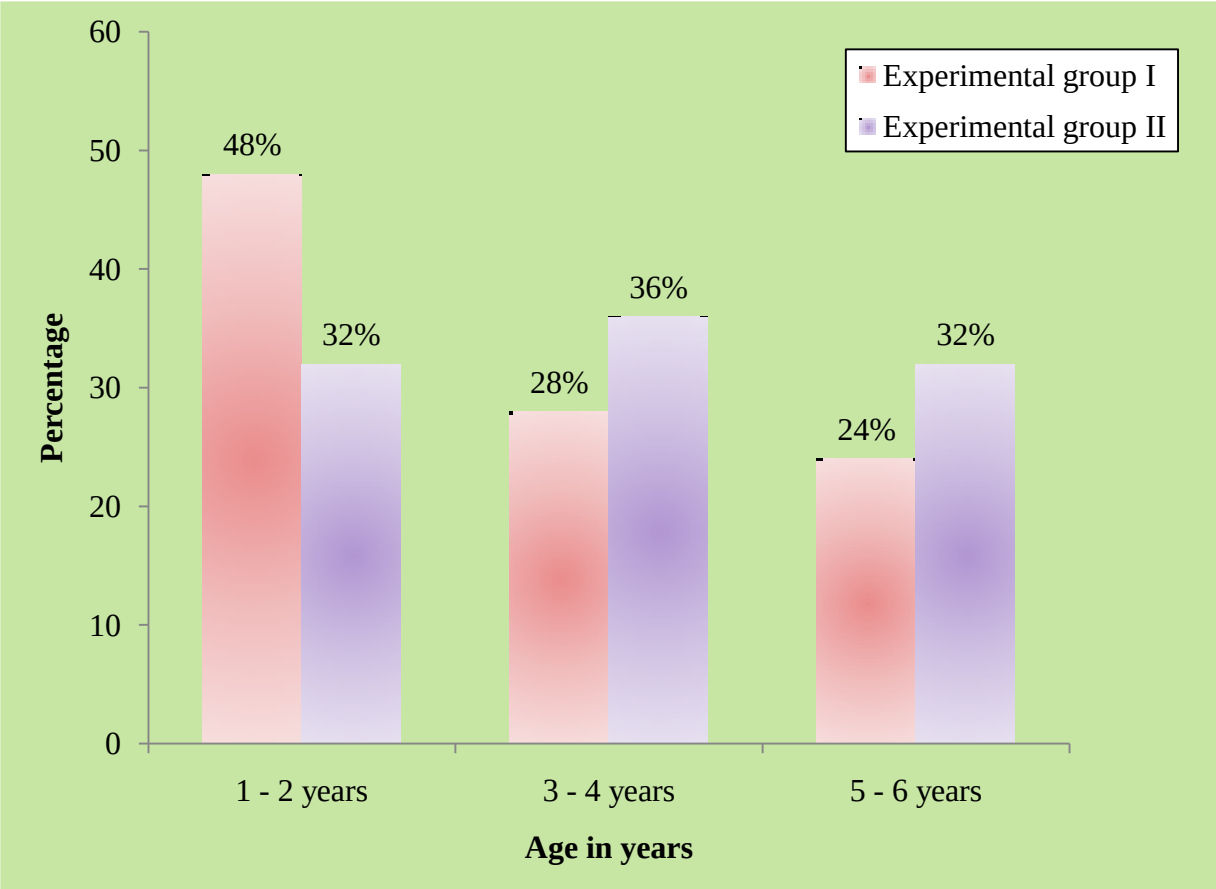


Figure .4 Distribution of Age in Experimental group I and Experimental group II

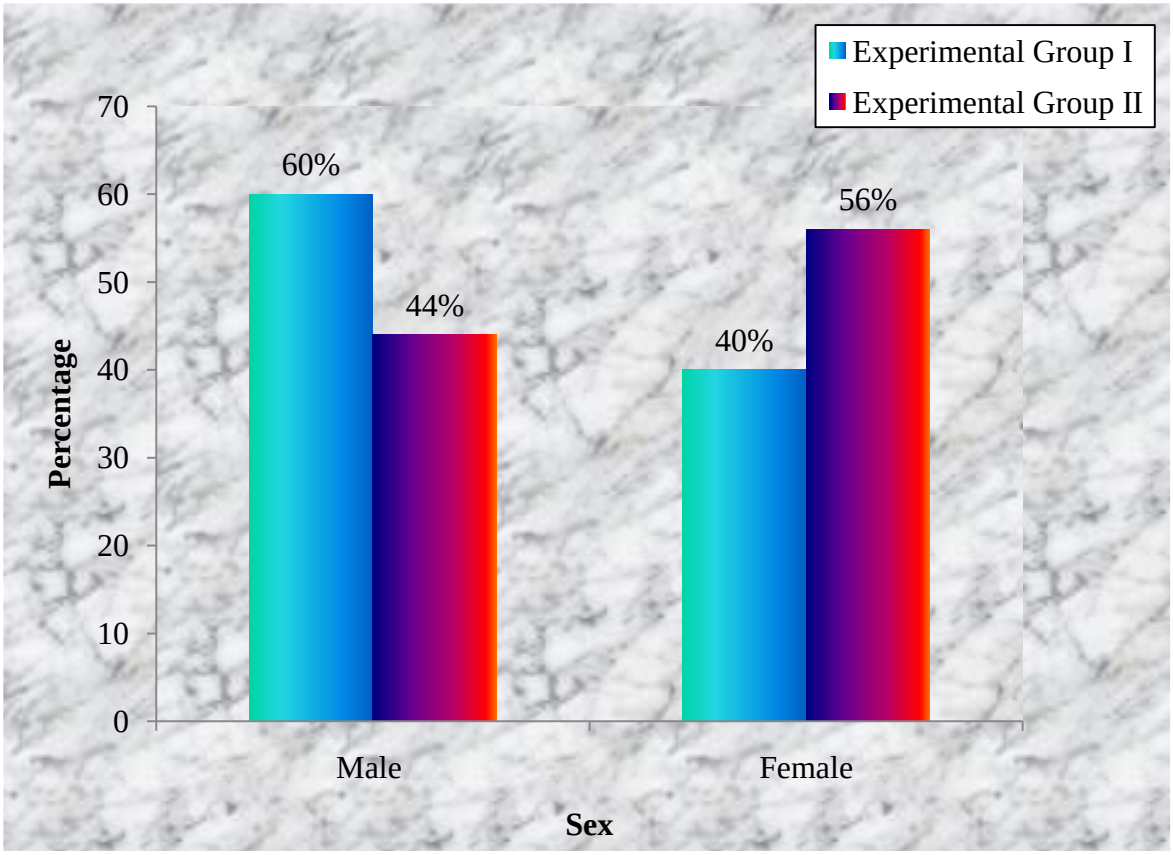


Figure .5 Distribution of Sex in Experimental group I and Experimental group II

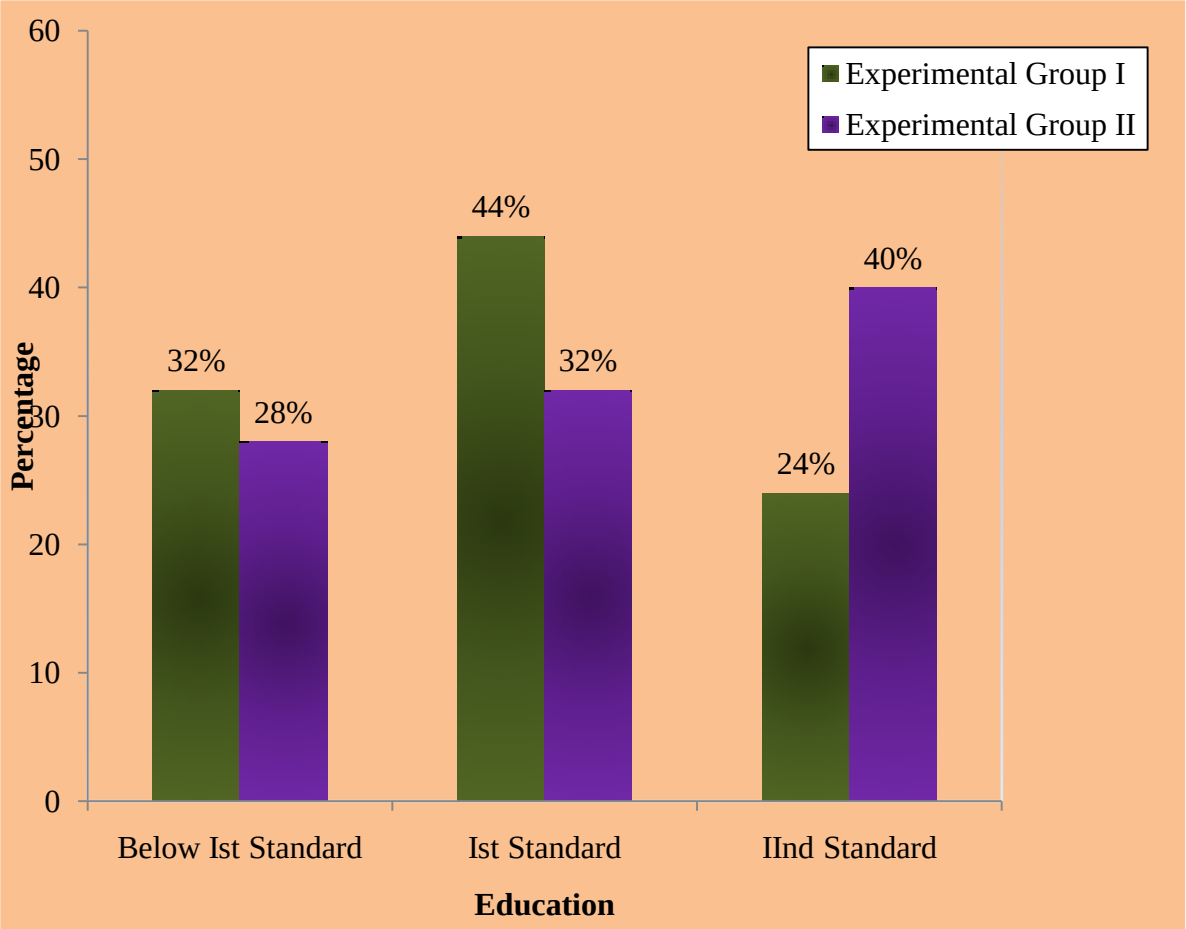


Figure .6 Distribution of Education in Experimental group I and Experimental group II

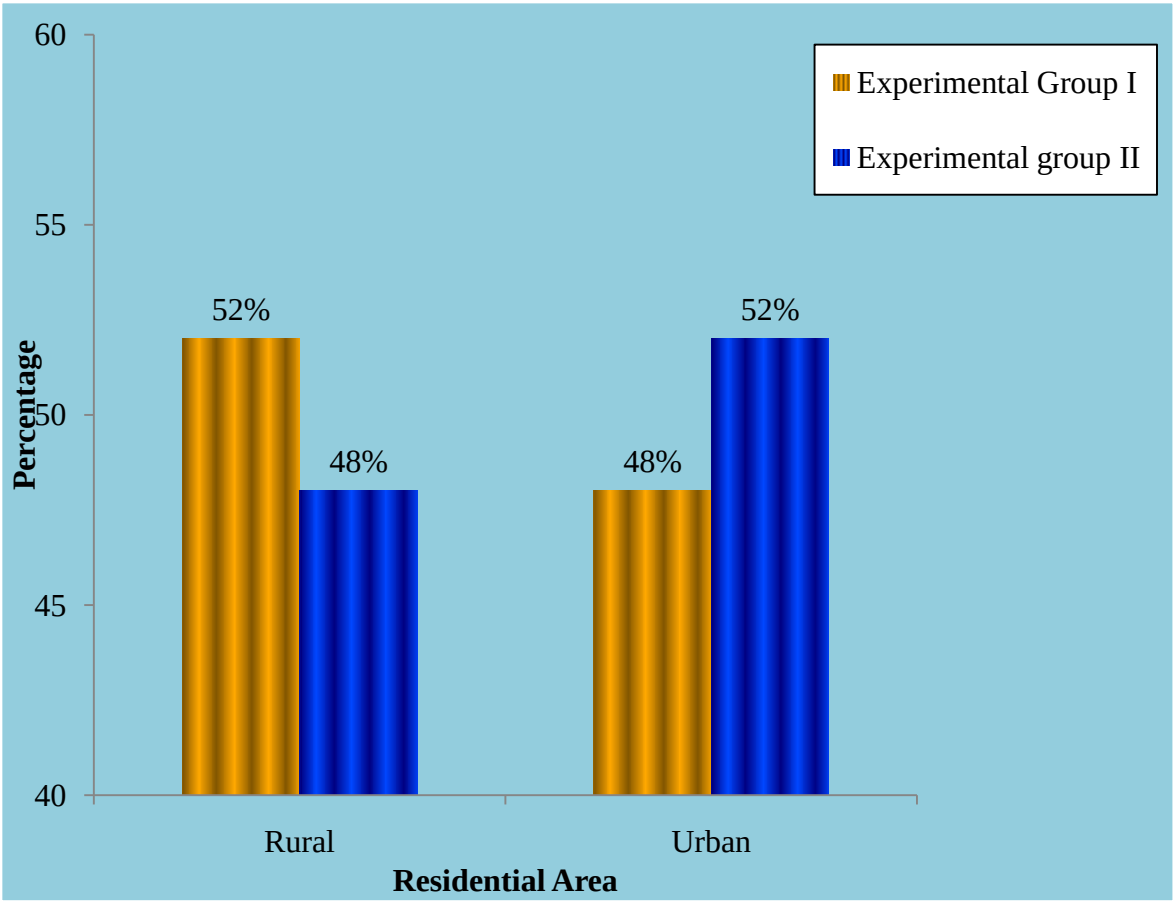


Figure .7 Distribution of Residential area in Experimental group I and Experimental group II

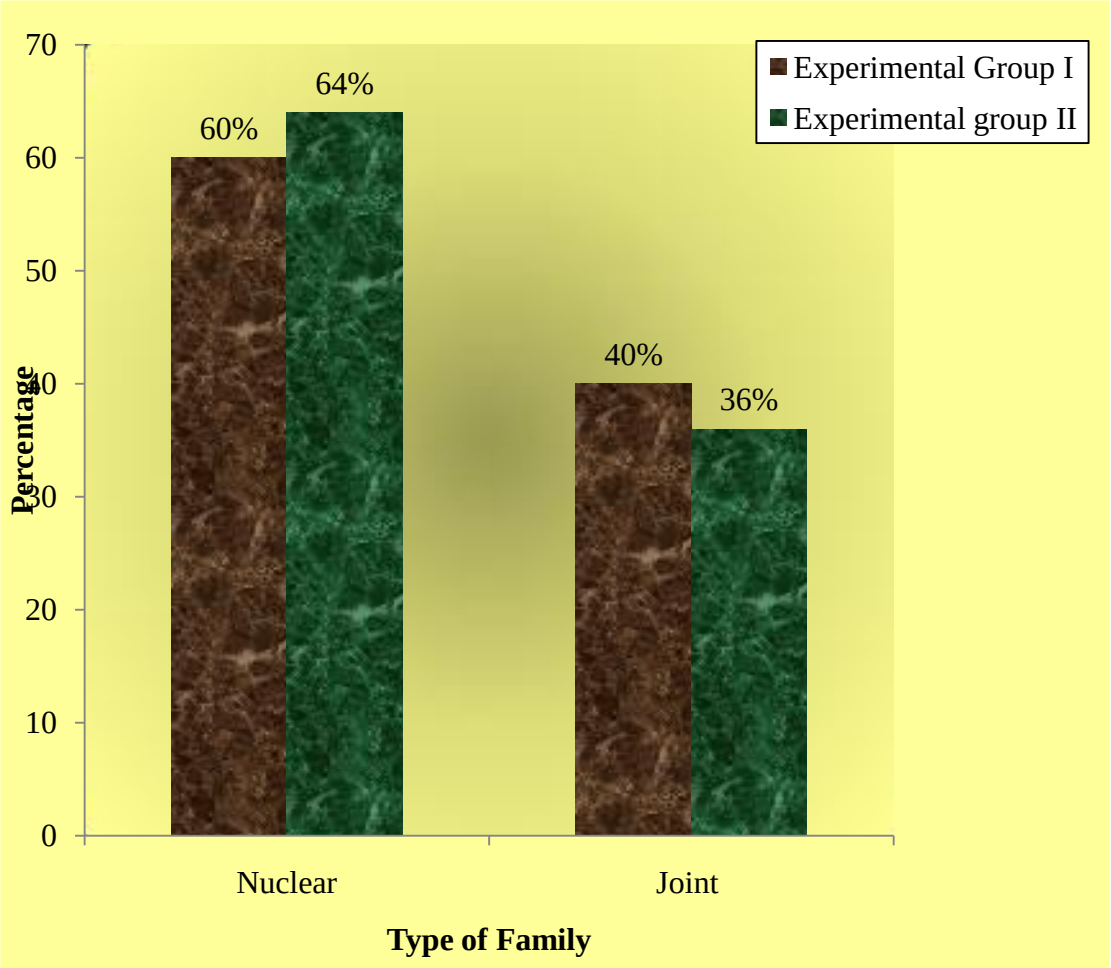


Figure .8 Distribution of type of Family in Experimental group I and Experimental group II

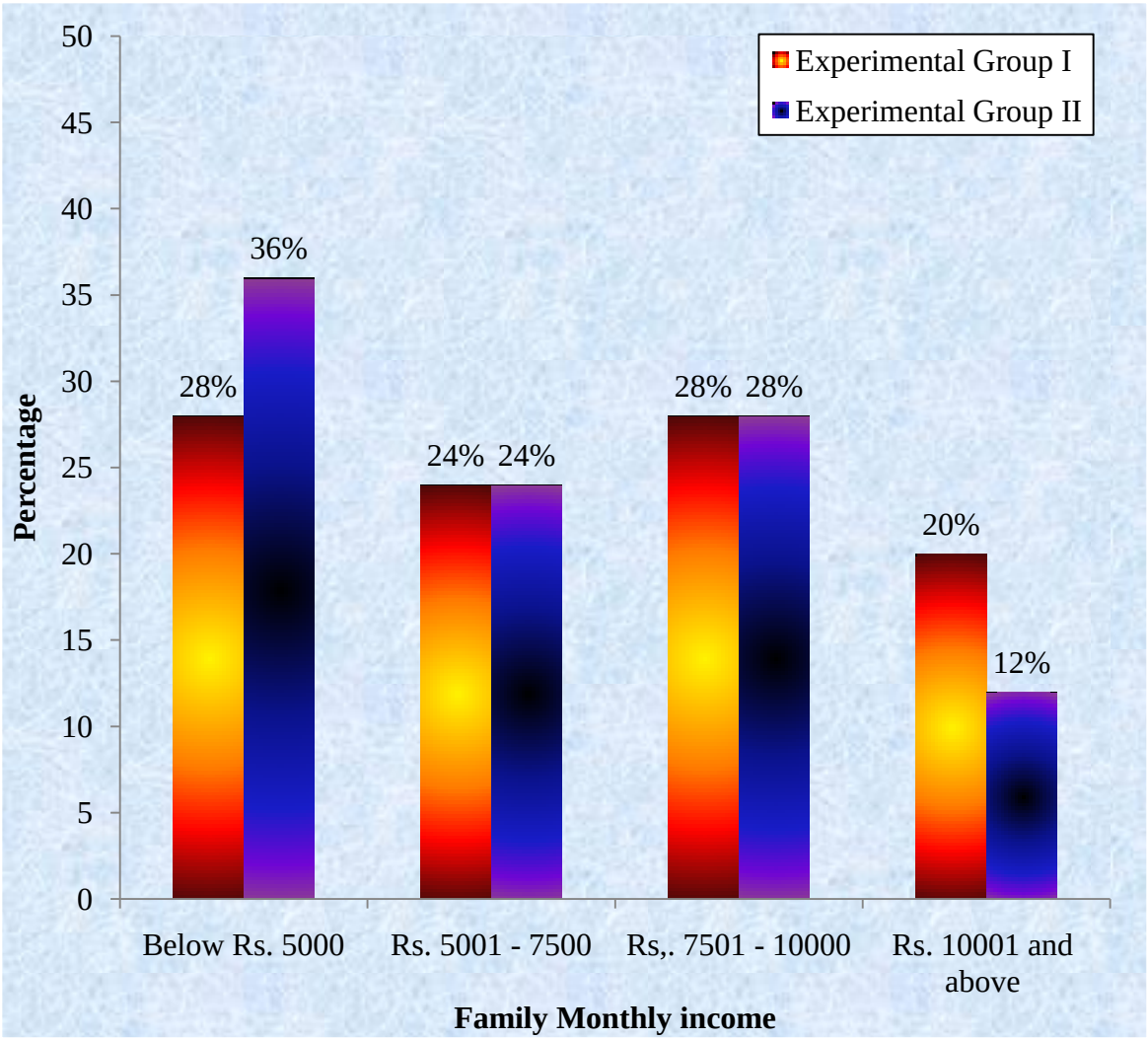


Figure .9 Distribution of Family Monthly Income in Experimental group I and

Experimental group II

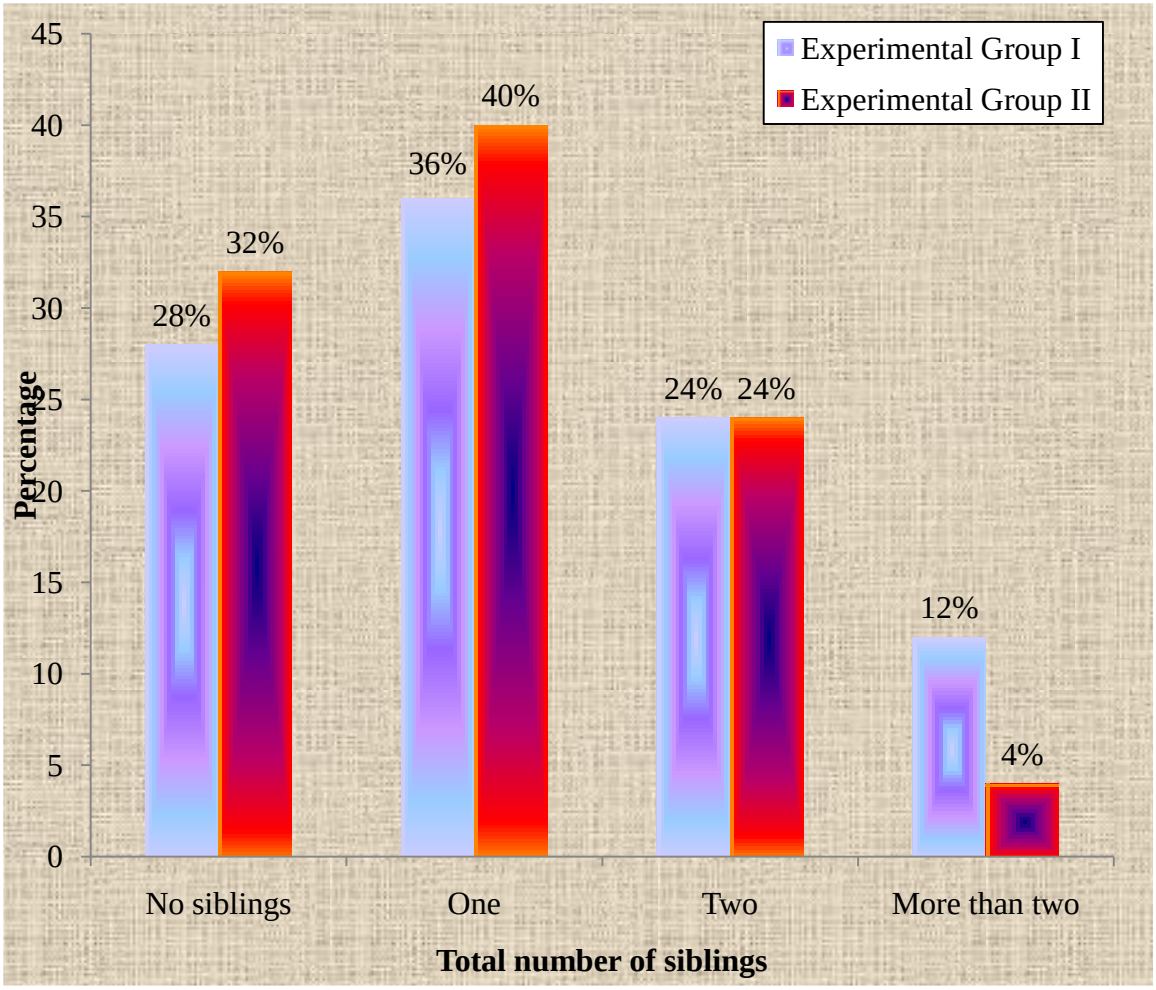


Figure .10 Distribution of Total Number of Siblings in Experimental group I and

Experimental group II

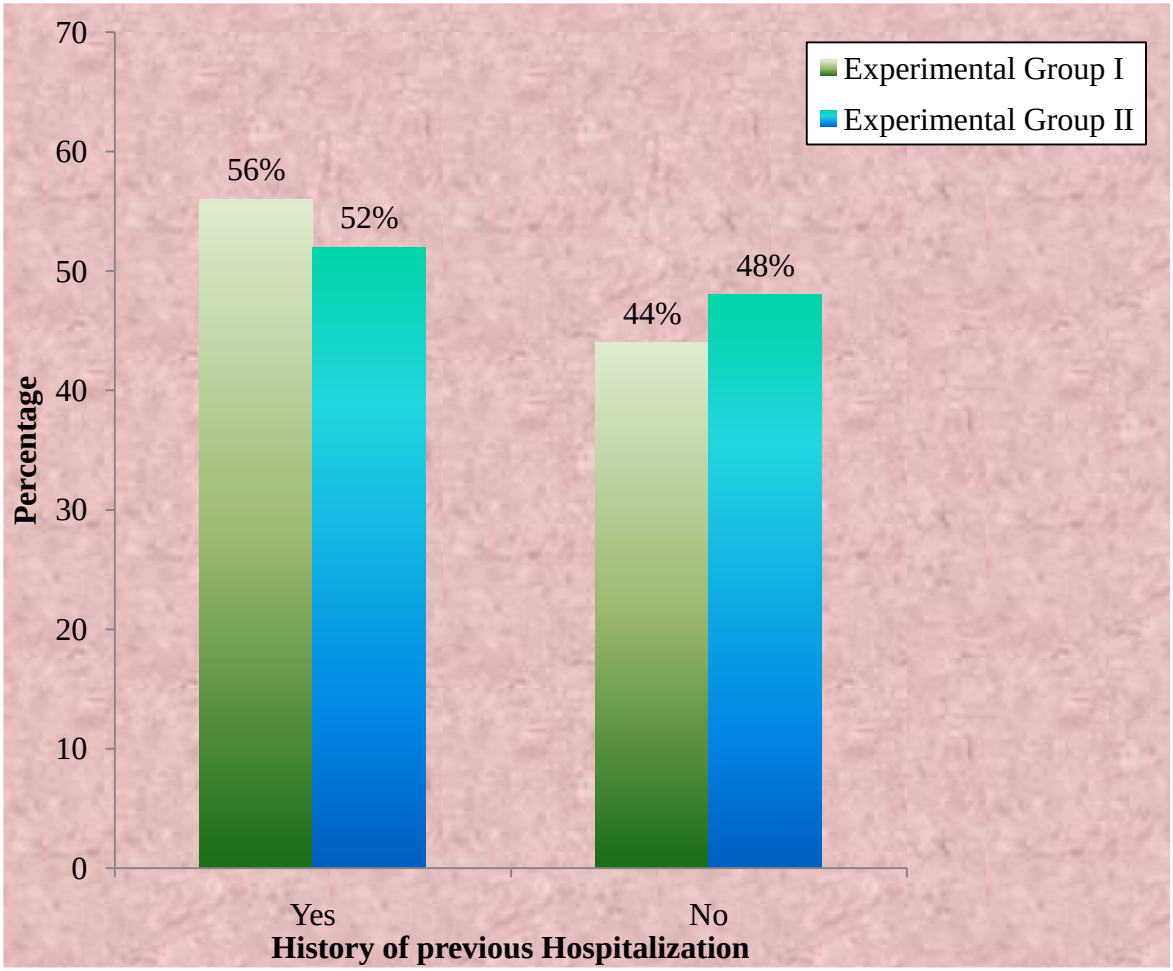


Figure .11 Distribution of history of Previous Hospitalization in Experimental group I and Experimental group II

SECTION – II

Table : 2 Distribution of Statistical Value of Hyperthermia Before and After Application of

Warm Sponging for Children Belonging to Experimental Group I.

Experimental Group I : Paired 't' Test

The comparative mean values, standard deviation and 't' test values between pre and posttest value of application of warm sponging for children belonging to Experimental Group I was given below

(n = 25)

S. No	**Temperature (Warm Sponging)**	**Mean**	**SD**	**Paired 't' test**
1	Pre test	102.5	0.16	
2	Post test	99.7	0.11	18.75*

*significant at 0.05 level

Table 2 shows that the calculated't' value is 18.75 at p = 0.05 level of significance, which is greater than the table value (t = 2.064). This shows that there was a high significant difference exists between the pretest and post test score of temperature in reducing Hyperthermia. This implies that there was a great influence of application of warm sponging in reducing hyperthermia.

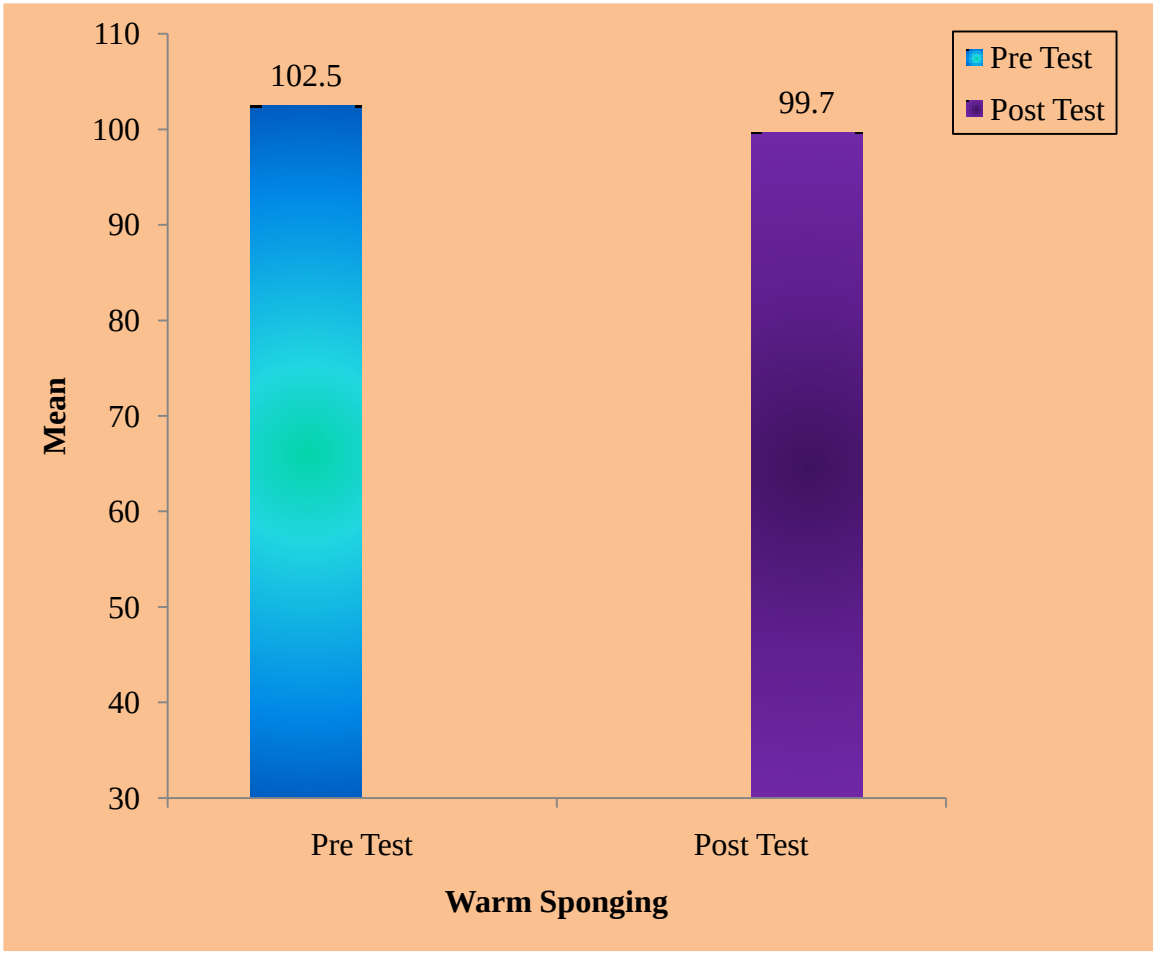


Figure .12 Distributions of mean Pretest and Post Test Score of Warm Sponging Among Experimental Group I

Table : 3 Distribution of Statistical Value of Hyperthermia Before and After Application of

Tepid Sponging for Children Belonging to Experimental Group II.

Experimental Group II : Paired 't' Test

The comparative mean values, standard deviation and 't' test values between pre and posttest value of application of Tepid sponging for children belonging to Experimental Group II was given below:

(n = 25)

S.No	**Temperature (TepidSponging)**	**Mean**	**SD**	**Paired 't' test**
1	Pre test	102.2	0.133	6.2*
2	Post test	101.2	1.9	

*significant at 0.05 level

Table 3 shows that the calculated 't' value is 6.2 at p = 0.05, level of significance, which is greater than the table value (t = 2.064). This shows that there was a high significant difference exists between the pretest and post test score of temperature in reducing Hyperthermia. This implies that there was also influence of application of Tepid sponging in reducing hyperthermia.

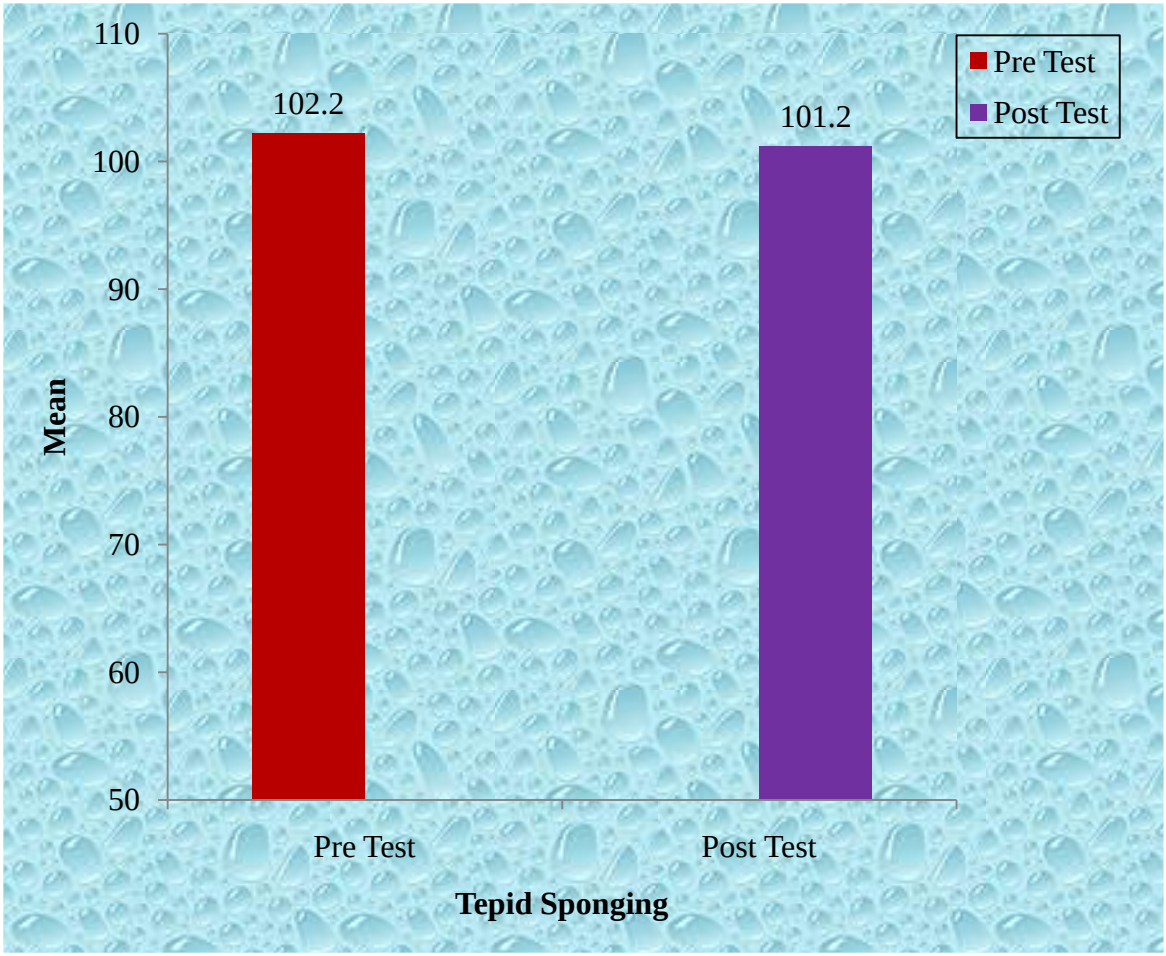


Figure .13 Distribution of mean Pretest and Post Test Score of Tepid Sponging Among Experimental Group II

SECTION – III

Comparison of Statistical Values of Hyperthermia Between the Experimental Group I and Experimental Group II

Experimental Group I and Experimental Group II : Independent 't' Test

Table : 4 Distribution of Statistical Pre Test Value of Temperature Between the Experimental group I and Experimental group II

(N = 50)

S.No	Pretest	Mean	S.D	Independent 't' Test
1	Experimental Group I	102.5	0.16	1.4*
2	Experimental Group II	102.2	0.133	

*Significant at 0.05 level

Table 4 shows that the calculated value is 1.4 at p = 0.05, level of significance, which is greater than the table value (t = 2.00). This shows that there exist no significant difference between the pretest values of Experimental Group I and II. This highlights that both warm sponging and tepid sponging have some effect on reducing the hyperthermia.

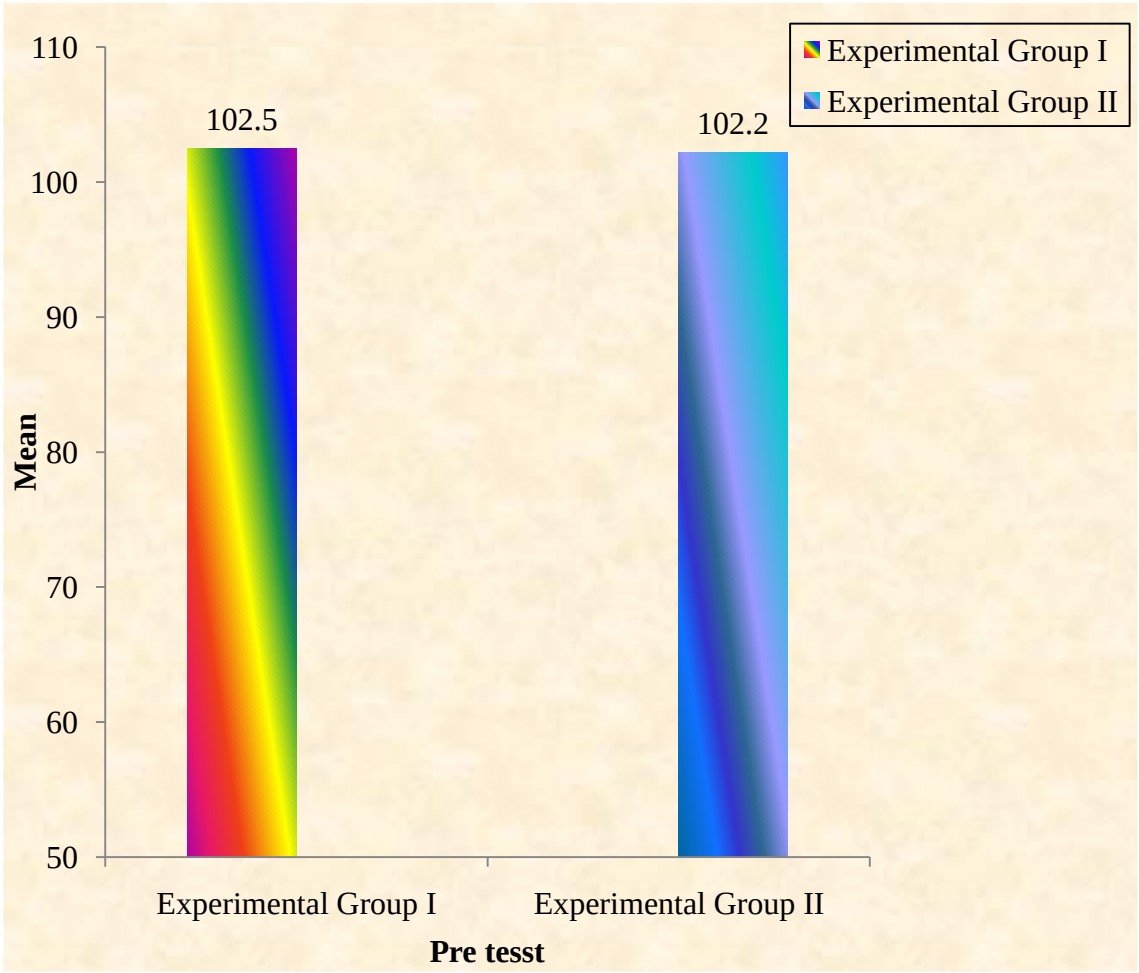


Figure .14 Distribution of Statistical Pretest Values of Temperature Between Warm Sponging and Tepid Sponging

Experimental group I and Experimental group II :

Independent ‘t’ Test

Table. 5. Distribution of Statistical Post Test Value of Temperature Between the Experimental group I and Experimental group II

(n = 50)

S.No	**Pretest**	**Mean**	**S.D**	**Independent ‘t’ Test**
1	Experimental Group I	99.7	0.11	6.7*
2	Experimental Group II	101.2	1.9	

*Significant at 0.05 level

Table 5shows that the calculated value is 6.7 at p = 0.05, level of significance, which is greater than the table value (t = 2.00). This shows that there exist a significant difference between the Posttest values of Experimental Group I and II. This highlights that both warm sponging has greater influence in reduction of hyperthermia when compared to tepid sponging.

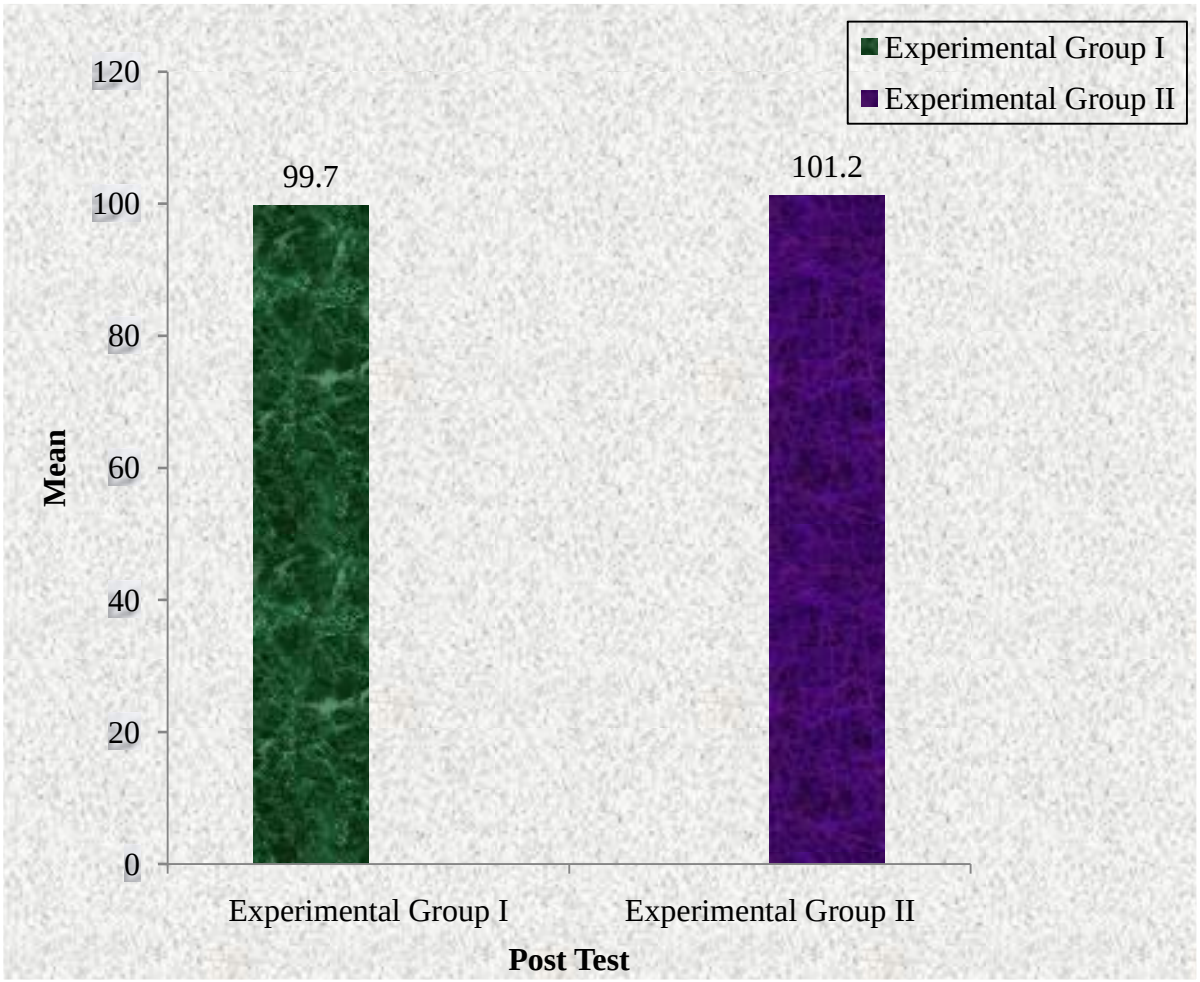


Figure .15 Distribution ofStatistical Post Test Values of Temperature Between Warm Sponging and Tepid Sponging

SECTION – IV

Table : 6 Associations of Selected Demographic Variables with Post Test score of Temperature who Received Warm Sponging Among Experimental Group I.

(n = 25)

S.No	Demographic Variables	Below Mean	Above Mean	χ^2
1	**Age in Years**			
	a) 1 - 2 years	7	6	1.25
	b) 3 – 4 years	5	2	
	c) 5 – 6 years	2	3	
2	**Sex**			
	a) Male	11	5	4.99*
	b) Female	2	7	
3	**Education**			
	a) Below I standard	2	6	4.24
	b) I standard	8	3	
	c) II standard	3	3	
4	**Residential Area**			
	a) Rural	5	8	3.37
	b) Urban	9	3	
5	**Type of Family**			
	a) Nuclear	8	7	0.025
	b) Joint	5	5	

(Table 6 continues)

(Table 6 continued)

S.No	Demographic Variables	Below Mean	Above Mean	χ^2
6	**Family Monthly Income**			
	a) Below Rs.5,000	2	5	
	b) Rs. 5,001 – 7,500	3	4	3.68
	c) Rs. 7,501 – 10,000	5	2	
	d) Rs. 10,001 and above	3	1	
7	**Total number of siblings**			
	a) No siblings	6	1	
	b) One	5	5	5.68
	c) Two	1	4	
	d) More than two	1	2	
8.	**History of Previous Hospitalization**	8	6	
	a) Yes	5	6	0.34
	b) No			

***- Significant**

Table 6 indicates the association of posttest values on warm sponging with selected demographic variables in experimental group I. It reveals that the sex of the child had significant association with post test scores. Other demographic variables were not associated with warm sponging.

Table : 7 Association of Selected Demographic Variables with Post Test score of Temperature who Received Tepid Sponging Among Experimental Group II.

(n = 25)

S.No	Demographic Variables	Below Mean	Above Mean	χ^2
1	**Age in Years**			
	a) 1- 2 years	2	6	6.53*
	b) 3 – 4 years	4	5	
	c) 5 – 6 years	7	1	
2	**Sex**			
	c) Male	4	7	1.93
	d) Female	9	5	
3	**Education**			
	a) Below I standard	4	4	1.7
	b) I standard	5	2	
	c) II standard	4	6	
4	**Residential Area**			
	a) Rural	6	7	0.37
	b) Urban	7	5	
5	**Type of Family**			
	a) Nuclear	9	7	11.22*
	b) Joint	4	5	

(Table 7 continues)

(Table 7 continued)

S.No	Demographic Variables	Below Mean	Above Mean	χ^2
6	**Family Monthly Income**			
	a) Below Rs. 5,000	7	2	
	b) Rs. 5,001 – 7,500	3	3	4.09
	c) Rs. 7,501 – 10,000	2	5	
	d) Rs. 10,001 and above	2	1	
7	**Total number of siblings**			
	a) No siblings	3	2	0.57
	b) One	5	6	
	c) Two	3	3	
	d) More than two	1	1	
8.	**History of Previous Hospitalization**	8	5	0.026
	a) Yes	7	5	
	b) No			

Table 7 indicates the association of posttest values on Tepid sponging with selected demographic variables in experimental group II. It reveals that the age, type of family, sex of the child had significant association with post

test scores. Other demographic variables were not associated with warm sponging.

CHAPTER – V

Results and Discussion

This study is two group pretest, posttest, quasi experimental study intended to compare the effectiveness of warm and tepid sponging in reducing hyperthermia among children between age group of 1 to 6 years. The result of the major study was discussed according to the objectives.

The First Objective of the Study was to Assess the Level of Body Temperature Before and After Warm Sponging Among Children Belonging to Experimental Group I

The Paired‘t’ test was performed to assess the effectiveness of warm sponging in reducing hyperthermia among children. The calculated value of ‘t’ was 18.75 at 0.05 level of significance which is greater than the table value (t=2.064). This shows that there was high significant difference between the pretest and post test scores in reducing hyperthermia.

A randomized parallel study to compare the efficacy of unwrapping alone, warm sponging alone, warm plus paracetamol, warm sponging plus unwrapping plus paracetamol. 52 children between age group of 3 months to 5 years with axially temperatures between (37.8°C to 40°C) were included. The result showed, paracetamol along with unwrapping and warm sponging caused fastest reduction of body temperature, unwrapping alone had a little

effect, paracetamol. Warm sponging had an additive effect and reduced fever more quickly than paracetamol.

The Second Objective of the Study was to Assess the Level of Body Temperature Before and After Tepid Sponging Among Children Belonging to Experimental Group II

Paired‘t’ test was performed to assess the effectiveness of Tepid sponging in reducing hyperthermia among children. The calculated value of ‘t’ value was 6.2 at 0.05 level of significance which is greater than the table value (t=2.064). This shows that there was high significant difference between the pretest and post test scores in reducing hyperthermia.

Milligan. O, et al., (2006) conducted a randomized trial to compare the efficiency of tepid sponging alone and tepid sponging plus paracetamol, paracetamol alone in children. There was significantly greater and more rapid reduction of fever wad demonstrated with paracetamol plus tepid group than paracetamol alone or tepid sponging alone group. Even though tepid sponging reduced the fever, its effect last only for first 30 minutes only. The study concluded that Paracetamol combined with tepid sponging had fastest effect and tepid sponging alone had least effect in reducing fever and caused minor discomfort like shivering, crying and irritability.

The Third Objective of the Study was to Compare the Effectiveness of Warm and Tepid Sponging in Reducing

Hyperthermia Among Children in Experimental Group I and Experimental Group II.

The independent‘t’ test was performed to compare the pretest value of experimental group I and II. The calculated value of ‘t’ is 1.4 at 0.05 level of significance, which is lesser than the table value (t =2.00). This shows that there was no significant difference between the pretest values of experimental group I and II.

The independent ‘t’ test was performed to compare the posttest value of experimental group I and experimental group II. The calculated value of ‘t’ is 6.7 at 0.05 level of significant, which is greater than expected value. This research shows that there was significant difference between the post test scores of experimental group I and experimental group II, which means, warm water sponging had greater influence in reduction of post temperature and preventing further rise in temperature for a longer period of time when compared to tepid sponging.

Leung, Luk, (2008) conducted a cross-sectional survey using questionnaire among, 113 pediatric nurses in three regional hospitals on effectiveness of warm sponging, tepid sponging, ice packs, cold sponging, paracetamol, etc. The result reveled warm sponging (89.4%), tepid sponging (76.1%), ice packs (69.9%), paracetamol (31.9%), cold sponging (5.3%). The study concluded that among the sponging method used the most frequently used method in ward setting was warm sponging due to the fact that it reduced the temperature and children were more comfortable after warm sponging.

The Fourth Objective of the Study was to Associate the Effectiveness of Warm Sponging in Reducing Hyperthermia Among Experimental Group I with Selected Demographic Variables

In association of degree of fever with selected demographic variables. It shows that there was a significant association between the sex of the child and post test score of temperature and all other variables showed no significant association with post test score of temperature and experimental group I.

Schmitt, (2007) conducted a randomized clinical study to identify the variables that correlate with effectiveness of warm sponging in reduce fever among children (1-6 years) admitted in hospitals. The findings showed that warm sponging had an additive effect in combination with paracetamol in reducing the fever than paracetamol alone group. He concluded that warm sponging had an addictive effect in rapid reduction of body temperature for a longer period in combination with paracetamol than other methods and there were no statistically significant association between fever and demographic variables.

The Fifth Objective of the Study was to Associate the Effectiveness of Tepid Sponging in Reducing Hyperthermia Among Experimental Group II with Selected Demographic Variables

In association of degree of fever with selected demographic variables, it shows that there was significant association between the age and family of child with post test score of temperature and all other variables showed no significant association with post test score of temperature among experimental group I.

Fernando Figueira, (2006) conducted a randomized clinical trial to compare the effectiveness of tepid sponging and dipyrone along with selected demographic variables among 876 children between the age group of 6 months to 5 years in selected hospitals. The study concluded that there were no statistically significant difference between the study groups with respect to age, sex, nutritional status, temperature, duration of fever on admission and clinical diagnoses hours.

CHAPTER – VI

Summary, Conclusion, Nursing Implications,

Limitations and Recommendations

Summary

The study was conducted to compare the effectiveness of warm and tepid sponging in reducing hyperthermia among children between the age group of 1 – 6 years.

The purpose of the study was to find out the effectiveness of warm and tepid sponging in reducing hyperthermia among children and implication of these findings into practice.

The Following Objectives Were Set for the Study

- To assess the level of body temperature before and after warm sponging among children belonging to experimental group I.
- To assess the level of body temperature before and after tepid sponging among children belonging to experimental group II.
- To compare the effectiveness of warm and tepid sponging in reducing hyperthermia among children in experimental group I and II.
- To associate the effectiveness of warm sponging in reducing hyperthermia with selected demographic variables.
- To associate the effectiveness of tepid sponging in reducing hyperthermia with selected demographic variables.

Hypothesis set for the Study

There is a significant difference in the effect of warm water sponging and rapid water sponging in lowering body temperature among children with hyperthermia.

Major Findings of the Study were as Follows

- The pre test mean value of body temperature for both experimental group I and experimental group II was 102.5 and 102.2 respectively.
- The post test mean value of body temperature for both experimental group I and experimental group II was 99.7 and 101.2 respectively.

- The obtained‘t’ value for body temperature in experimental group I was 18.75.
- The obtained‘t’ value for body temperature in experimental group II was 6.2.
- The obtained ‘t’ value of pretest scores for the comparison of body temperature of experimental group I and experimental group II was 1.4.
- The obtained ‘t’ value of post test scores for the comparison of body temperature of experimental group I and experimental group II was 6.7.

Conclusion

The result shows that application of warm sponging and tepid sponging was effective in reducing hyperthermia among children in both experimental group I and experimental group II soon after giving sponging. Children who received warm sponging has fastest effect in reducing hyperthermia for a longer period, more comfortable and those receiving tepid sponging has some forms of discomfort like shivering and excessive crying. Even though tepid sponging had caused reduced the temperature (fever) soon after sponging, the temperature was again raised to higher degree when assessed at 30 and 45 minutes interval, were as in warm sponging temperature was found to be maintaining within normal limit when assessed at 30 and 45 minutes. So the application of warm water sponging need to be encouraged and further research need to be conducted in a large group to find out its effectiveness and brought in to practice.

Nursing Implications

The finding of the study has implications in various areas of nursing practices, nursing administration, nursing education and nursing research.

Nursing Education

- The nursing curriculum should be updated with the inclusion of topic on effectiveness of warm sponging in reducing fever.
- The emphasis needs to be planned on preventive and promotive health practice.
- The results of the body emphasis the learners to utilize the knowledge of warm and tepid sponging in reducing hyperthermia in children both in clinical and home settings.
- This procedure can be incorporated in the nursing curriculum and periodic conference, seminars, symposium etc, can be arranged on warm and tepid sponging in reducing hyperthermia.
- Application of warm sponging for management of fever can be included as nursing procedure to provide care during hyperthermia.
- Warm sponging is considered as complimentary alternative therapy and can be imparted to nursing students to improve their skills in providing alternative therapy and to update their knowledge on evidence based practices.

Nursing Practice

- The findings of the study indicate that the nurses should be made aware of application of warm sponging for children with hyperthermia.

- The nurse should have up to date knowledge about the advantage of application of warm sponging so that they are able to impart appropriate knowledge to their clients.
- The present study indicates that non-pharmacological methods had no side effects and were found to be effective so application of these measures need to be encouraged.
- The finding of the study indicate the application of warm sponging reduces fever more quickly and maintains temperature without further rising for a longer period than tepid sponging and has no discomfort to the children. Being a non-invasive method it does not require additional equipment, articles etc.
- Findings of the study also add knowledge in the field of nursing regards the effct of non-pharmacological intervention.
- Health information can be imparted through various measures like demonstration, mass media, pamphlets etc.
- The nurse could explain advantages of warm water sponging to patient with fever. It will be of immense help to improve quality of life, reduce the fever and prevent complications and side effects of anti-pyretic medications. It is safe and cost effective.

Nursing Administration

- The nurse administrator needs to take an interest in formulating principles and adopting the various modalities of treatment for fever.

- The nursing administrators serve as a resource personal for young nursing student, patient and family members for providing guidance and counseling.
- In service education programme should be organized for nurses to update their knowledge about warm sponging and practice the application of warm sponging to reduce hyperthermia and prepare written policies about evidence based practice.
- Regular supervision of staff nurse can be carried out while doing these procedures. Evaluate the quality of nursing care by conducting regular clinical audit.

Nursing Research

- The essence of research is to build up knowledge in nursing since it has been a dynamic and changing profession. The effectiveness of the research study can be made further implications in clinical practice.
- Emphasize should be laid on research in the area of non-pharmacological measures for fever management in children which has no side effects
- Further research can be conducted to reduce fever by means of hot and cold application
- For generalization of application of warm sponging versus tepid sponging in reducing hyperthermia, further studies can be conducted in hospital for a longer duration with larger samples.

- It can be used as a motivation for nurses to conduct research studies in different alternative complimentary therapy in future to bring about newer perspectives in nursing care.

Limitations

- The study was conducted among small group in a selected hospital which limits generalization.
- The study was conducted for a short period
- Further assessment cannot be carried out due to prescribed period.
- Assessments at fixed time schedule were not possible because of hospital policies
- Behavioral response of the child to sponging was not taken for the present study.
- Effectiveness of paracetamol alone to reduce fever was not included in the study.

Recommendations

- A similar study can be conducted for a large group on a long term basis.
- A comparative study can be conducted to compare the effectiveness of warm sponging alone, warm sponging plus paracetamol in reducing hyperthermia.
- A study has to be done on the temperature of warm water that needs to be used in sponging without paracetamol in reducing

hyperthermia.Effectiveness of warm water sponging can be assessed by conducting the study with control group and experimental groups.

பகுதி - 1

கீழே கொடுக்கப்பட்டுள்ள விபரங்களை சரியாக (☐) செய்யவும்

1) மாதிரி எண்:

2) குழந்தையின் வயது (வருடங்கள்)

அ) 1-2 வயது ☐

ஆ) 3-4 வயது ☐

இ) 5-6 வயது ☐

3) பாலினம்

அ) ஆண் ☐

ஆ) பெண் ☐

4) கல்வி நிலை

அ) பாலர் வகுப்பு ☐

ஆ) முதல் வகுப்பு ☐

இ) இரண்டாம் வகுப்பு ☐

5) குடியிருப்பு பகுதி

அ) கிராமம் ☐

ஆ) நகரம் ☐

6) குடும்பம்

அ) தனிக்குடும்பம் ☐

ஆ) கூட்டுக்குடும்பம் ☐

7) மாத வருமானம்

அ) ரூ. 5000க்கு கீழ். ☐

ஆ) ரூ. 5001 - 7500 ☐

இ) ரூ. 7501 - 10,000 ☐

ஈ) ரூ. 10,000∴-க்கு மேல் ☐

8) உடன் பிறந்தோரின் எண்ணிக்கை

அ) இல்லை ☐

ஆ) ஒன்று ☐

இ) இரண்டு ☐

ஈ) இரண்டுக்கு மேல் ☐

9) இதற்கு முன் மருத்துவமனையில் அனுமதிக்கப்பட்டதுண்டா?

அ) ஆம் ☐

ஆ) இல்லை ☐

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ABSTRACT

Statement of Problem: A comparative study to assess the effectiveness of Warm and Tepid Sponging in Reducing Hyperthermia among Children between the age group of 1-6 years in Ashwin Hospital, Coimbatore. **Objectives:** a) To assess the level of body temperature before and after warm sponging among children belonging to Experimental Group I. b) To assess the level of body temperature before and after tepid sponging among children belonging to Experimental Group II. c) To compare the effectiveness of warm and tepid sponging in reducing hyperthermia among children in Experimental group I and experimental group II. d) To associate the effectiveness of warm sponging in reducing hyperthermia with selected demographic variables. e) To associate the effectiveness of tepid sponging in reducing hyperthermia with selected demographic variables. **Methodology** :The research design selected for the study was quasi experimental design (two group pre test and post test design) sample size for this study was 50 out of which 25 belong to experimental group I and 25 belongs to experimental group II who are selected by purposive sampling technique. Temperature was monitored using a digital thermometer, temperature recording data sheets and demographic variables were used to collect data. **Results:**Descriptive and inferential statistics were used to analyze the data. The independent‘t’ test was performed to compare the post test value of warm and tepid sponging in experimental group I and experimental group II. The calculated value of ‘t’ was 1.4 and respectively which is greater than the table value. This shows that there was significant difference in post test value of experimental group I and experimental group II. Conclusion: Warm sponging and tepid sponging were effective in reducing the body temperature, where as warm sponging had an additive effect and prevented further rise in body temperature for longer period of time when compared to tepid sponging and children experience little or no discomfort with warm sponging.

LIST OF EXPERTS

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REQUISITION LETTER FOR CONTENT VALIDITY

From

M.Sc (N) II Year,

PPG College of Nursing,

Coimbatore-35.

To

Through :**Principal , PPG College of Nursing.**

Respected Sir/ Madam,

Sub : Requisition for expert opinion and suggestion for content validity of tool.

I am a student of M.Sc (N) II Year, PPG College of Nursing affiliated to the Tamilnadu Dr. M.G.R Medical University, Chennai. As a partial fulfillment of the M.Sc (N) programme. I am conducting

A COMPARATIVE STUDY TO ASSESS THE EFFECTIVENESS OF WARM AND TEPID SPONGING IN REDUCING HYPERTHERMIA AMONG CHILDREN BETWEEN THE AGE GROUP OF 1 TO 6 YEARS IN ASHWIN HOSPITAL, COIMBATORE.

Here with I have enclosed the developed tool for content validity and for the expert opinion and possible solution. It would be very kind of you to return the same as early as possible.

Thanking you,

Yours faithfully,

PPG COLLEGE OF NURSING

FORMAT FOR THE CONTENT VALIDITY

Name of the expert :

Address :

Total content for the tool :

Kindly validate each tool and tick wherever applicable

S.NO	No. of Tool/Section	Strongly Agree	Agree	O.K	Not Applicable	Need Modification	Remarks

Remarks Signature of the

Expert with date

SECTION – A

Demographic Profile

Instructions

Read the following questions carefully and give tick(✓) in the given boxes for correct answers.

1) Sample No:

2) Age in years

a) 1 – 2 years ☐

b) 3 – 4 years ☐

c) 5 – 6 years ☐

3) Sex

a) Male ☐

b) Female ☐

4) Educational status

a) Below I Standard ☐

b) I Standard ☐

c) II Standard ☐

5. Residential Area

a) Rural ☐

b) Urban ☐

6. Type of Family

a) Nuclear ☐

b) Joint ☐

7. Family Monthly Income

a) below Rs. 5000 ☐

b) Rs. 5001 – 7500 ☐

c) Rs.7501 – 10000 ☐

d) Rs. 10001 and above ☐

8. Total number of siblings

a) No siblings ☐

b) One ☐

c) Two ☐

d) More than two ☐

9. History of previous Hospitalization

a) Yes ☐

b) No ☐

SECTION – B

Temperature Recording Data Sheet

S.No	Pretest Temperature	Post Test Temperature				
		0 Minutes	15Minutes	30Minutes	45Minutes	Remarks

PROTOCOL FOR WARM AND TEPID SPONGING

Introduction

Fever is a natural process, due to body's fight against an enemy. However, when fever itself becomes a problem, as when it causes a lot of discomfort, induces vomiting or seizures, so it must be brought down. The management of fever can be started by a variety of ways, including medication and physical cooling measures like sponging, cool drinks, cool environment, fanning etc. Among the sponging methods rapid sponge and warm sponge bath is considered as one of the best method for treatment of hyperthermia. The main advantages of physical cooling methods are cheap, readily available and frequently used by caregivers in hospitals and pediatric clinics.

Definition

Sponge bath

Sponge bath - Sponging consists of the application of liquid by means of a sponge, a wash-cloth, or hand, in which the chief effect is derived from the liquid itself, little friction being needed. Sponge bath with warm water reduces fever by dilating superficial blood vessels, thus releasing heat and lowering body temperature.

Tepid Sponging

Tepid Sponging – means body is wiped with tepid water, not hot but not cold that is, (85-92°F/30-33°C) for a period of 15-20 minutes.

Richardson, 2010

Warm Sponging

The body is rubbed with a wet cloth or sponge cloth for a period of 15 – 20 minutes using warm water with temperature ranges between 37 – 40.5 degree Celsius or 98.6 to 105 degree Fahrenheit. Water for hot sponge bath should be as hot as tolerated. The sponge bath should be done fast and with friction to encourage blood to the surface.

- Mary T. Kowalsi, 2007

Purpose

- To reduce high fever
- To provide a sedative effect
- To relieve pain and provide comfort
- To reduce congestion, inflammation, or swelling
- To promotes healing

Effects of Sponging

- Reduces fever or lowers body temperature
- Sedative effects.

Assessment

- Assess the range and pattern of hyperthermia
- Assess the need for tepid and warm sponging
- Assess the ability of the child to cooperate during procedures
- Assess the level of consciousness
- Assess the need for assistance

Goal

- To reduce fever to safe level
- To improve the comfort of the patient with fever
- To assess the physical and mental status of the child
- To find out the cause for hyperthermia

Articles Required

- Bath basin (2)
- Bath blanket
- Wash Towel (2)\
- Bath towel (2)
- Disposable gloves
- Tepid water and warm water
- Lotion thermometer
- Towel
- Water proof pad
- Digital thermometer
- Small towel
- Mackintosh

Contra Indications

- Seizure
- Burns, head injury, septicemia, open wounds etc
- Unconscious or seriously sick children

Before the Procedure

- Explain to the child and mother what you will be doing (The bath is ineffective if the patient is nervous or frightened)
- Assess the need for sponging as well the condition of the child
- Record the temperature before beginning the bath
- Gather the needed supplies: bath basin, several washcloths, towels and a bath sheet.
- Fill the bath basin with tepid water or warm water as needed (You may need to refill the basin several times throughout the bath, to prevent the water from becoming too cool).

Temperature of Water Needed for Tepid and Warm Sponge Bath

Tepid Sponging – temperature of water should be between (85-92°F / 30-33°C)

Warm Sponging - temperature of water should be between (98.6 - 105°F / 37-40.5°C)

Duration

15 – 20 minutes. The sponge may be repeated after 1 or 2 hours if the fever persists.

Procedure for Tepid and Warm Sponge Bath

- Explain the procedure to the parents and child
- Provide privacy, and make sure the room is warm
- Wash your hands thoroughly and put on gloves, if necessary.
- Check for the medication that has to be administered
- Prepare and assemble all the equipment near the bedside table.
- Take and record temperature, pulse and respiration
- Place a water proof sheet and bath blanket beneath the patient.
- Drape patient with a bath blanket or sheet.
- Remove the patient's gown
- Check the temperature of the water. For warm sponging temperature should be between 37 to 40.5 degree Celsius or 98.6 to 105 degree Fahrenheit and for tepid sponging temperature of water should be between 27 to 32 degree Celsius or 85 to 92 degree Fahrenheit.
- Sponge one part at a time in the following order: face, arms, abdomen, legs, feet and back. For the arm or leg, spread the towel under the whole length of the arm or leg while it is being sponged.
- Wash the patients face and neck with tepid water sponge face for about 5 times, then dry. The wash cloth is folded in this manner to allow more water to be absorbed and provide more cooling effect on the skin surface.

- Lift the corner of the bath blanket and bath the child's body, part by part. Sponge arm nearest you, dry and cover with sheet then proceed with the other arm and legs for 5 minutes. Expose one area at a time.
- Place moist washcloths over the major superficial blood vessels in the axilla, groin, and popliteal areas to accelerate cooling. Change the wash cloths as they warm.
- Check the temperature of water in between the procedure (if the child begins to shiver the water temperature should be increased or stop the bath).
- Turn the patient and repeat the procedure beginning with neck, then going to the shoulders, the back, and so forth.
- Observe the patient for chills, shivering, pallor, mottling, cyanosis of the lips or nail beds, and vital signs.
- After the bath, make sure the patient is dry and comfortable. Dress him in a fresh gown and cover him lightly.
- Arrange pillow and bedding for the patient's comfort.
- Take the T.P.R. 30 minutes after the sponge bath and check the tolerance of child for the treatment.

Note

- ***Date and time, temperature of water used***
- ***Area to which packs or compress***
- ***The applied, duration, patient's tolerance,***
- ***Any other pertinent observations.***

After Care

- Wash hand and replace all the equipment
- Record the date, time and duration of the bath; the temperature of the solution; the patient's temperature, pulse, and respirations before, during and after the procedure; any complications that arise; and the patients tolerance for treatment.
- Check temperature every 15 minutes.

Difference Between Warm and Tepid Sponging Application

Warm Sponging

- In warm sponging, as much as possible the water used should be as hot as can be tolerated by the patient (98.6 to 105 degree Fahrenheit)
- In warm sponge bath sponging should be as fast as you can and with friction to enhance blood circulation.
- Sponge the skin quickly with a face towel to stimulate the blood to circulate
- Warm sponging is done quicker when compared to tepid sponging to stimulate blood to circulation.

Tepid Sponging

- In tepid sponging, water with a temperature of 85 to 95 degrees Fahrenheit is used.
- In tepid sponging, there is no rubbing action i.e., Sponge and let the skin becomes dry. Do this very gently and with just little amount of friction.
- Tepid sponging is done slowly.

Conclusion

Among the non-pharmacological methods, tepid and warm sponging had been effective in reducing hyperthermia. It is safest method with no side effects to treat hyperthermia especially in children. Warm sponging had an additive effect on reducing fever more quickly than tepid sponging and the use of warm sponging need to be encouraged. Tepid sponging may cause mild discomfort like shivering. This can be managed by the use of hot or warm water application, especially warm water application which reduces temperature by reducing fever by improving the blood circulation by vasodilatation there by increasing the heat lose.

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